

MINING CONGRESS JOURNAL



Okay Uncle Sam

No Exhibits At 'Cincy'

Plans for the Exposition to be held in conjunction with the 1942 Coal Convention were based on the considered opinion of industry leaders that it would help the nation's war effort—that it would speed the production of coal and help condition the industry for war service. For 19 years this meeting has served as the basis of close cooperation between operators and manufacturers toward the progress of the industry. During several months past over two hundred men have been working hard to make the 1942 meeting of greater value than ever before. They were honestly convinced that both the exhibits and the convention discussions would serve a real purpose.

However, Uncle Sam, you have ruled the Exposition out and your judgment goes with us. We are enlisted in your service "til hell freezes over"—we know how to obey orders promptly and cheerfully—and we're all set to do our duty.

SO, THE EXHIBITS ARE OUT

But the Convention, Shortened To Two Memorable Days, Goes On!

(See page 33)



The easy way!
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RAIL WITH A FEW
SIMPLE HAMMER BLOWS**

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MINING CONGRESS JOURNAL

Vol. 28

MARCH, 1942

No. 3

Recognizing the need of changes in Priority Orders P-56 and P-56-a so as to speed delivery of equipment to producers of war minerals, the War Production Board made important revisions in these orders, effective March 2. See page 50 for explanation.

WPB is reviewing the situation of western mines producing gold and silver. As this issue goes to press the American Mining Congress is taking part in a conference at Denver to consider means whereby possible hardship to such mines may be alleviated.

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Opinions expressed by authors within these pages are their own, and do not necessarily represent those of the American Mining Congress

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THE AMERICAN MINING CONGRESS

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Howard I. Young, President Edward B. Greene, Vice President
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Julian D. Conover, Secretary

MARCH, 1942

*It's Results
that count to-day*



★
★
★
★
★
★

**Just as the modern soldier is vastly
helped by mechanization...so is the
man in the mine aided by
JOY MECHANIZED EQUIPMENT**

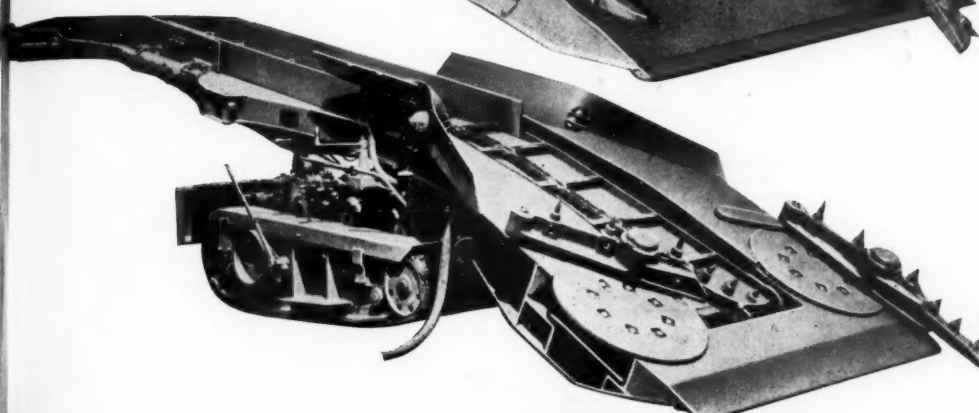
JOY MECHANIZATION

speeds output !



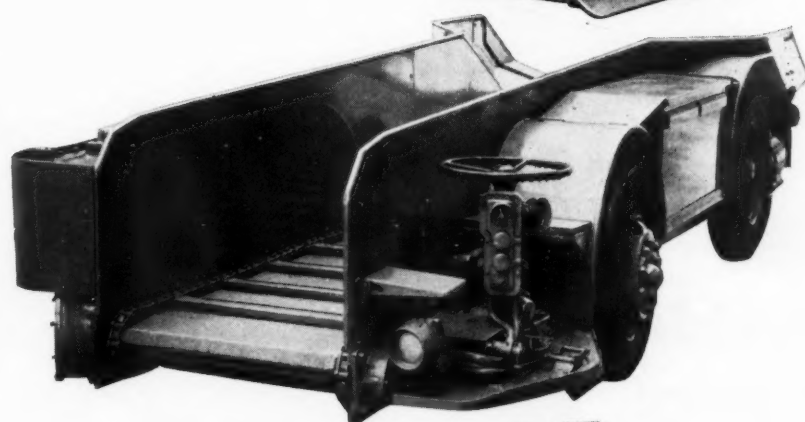
LOW VEIN MACHINE

JOY 14-BU LOADER
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26" high... 5 tons per
minute.



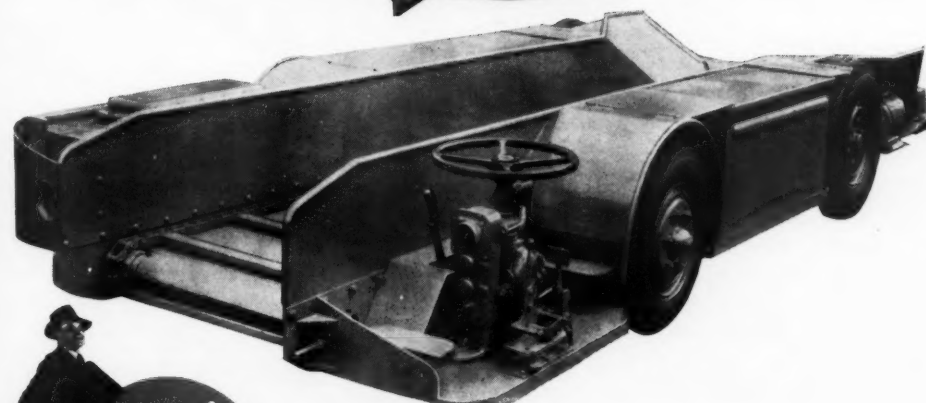
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—heavy duty, high
capacity, 8-10 tons per
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CAR**—6 ton capacity
for high seams.



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**JOY 32" SHUTTLE
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for low seam operation.



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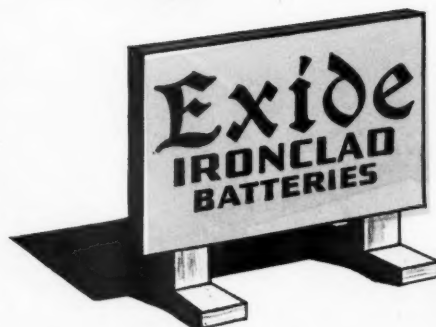
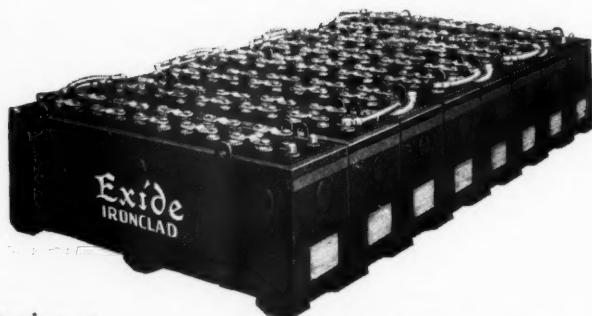


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With the Nation's resources mobilized for the efficient, all-out prosecution of the war, the country's vast network of highways takes on a new significance. It is on them that the speedy movement of men and materials depends. In the mining industry, too, the movement of materials has been stepped up to a new tempo—one in which Marion shovels are wielding a major influence in the speedy digging and loading of materials for hauling to the processing plants. Today, MARION'S dependable performance is being utilized by miners and contractors from coast to coast in an all-out "blitz" against TIME. In this way, MARION is bringing defeat closer to the enemies of democracy.



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"X-Ray" Booklet Shows New Features of Improved Robins-Gyrex Screen; Reader Builds Typical GYREX in Unique Catalog

Construction, Design Details Highlighted

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PASSAIC, N. J.—Robins Conveying Belt Company, this city, has just released for free distribution a handsome "X-ray" type booklet which describes in an interesting and complete manner recent improvements and general information regarding the well-known ROBINS-GYREX Vibrating Screen. The new catalog (Robins Bulletin No. 115) is replete with unusual effects, all of which are successful in making plain to the reader the scientific design and rugged construction of GYREX Screens.

X-Ray Feature

In the first few pages of the new Bulletin, the various important parts of the GYREX Screen are printed on separate transparent sheets. Together these pages make up a complete screen, but taken separately they permit the reader to study each element of construction or design independently of the rest.

Installation Pictures

In the center of the new GYREX Bulletin is a colorful three-page spread which testifies to the versatility of GYREX Screens. In all, thirteen actual installations are reproduced, including Sand, Gravel, Coal, Coke, Limestone, Pebble Phosphate, Rip-rap and many other applications.

Complete Layout Dimensions

Complete dimensions with drawings for layout purposes are furnished in Bulletin No. 115, for both Cast Base and Steel Base GYREX Screens. Use the convenient coupon below and request your copy of the "X-Ray" Bulletin today.

DON'T WASTE MATERIALS. If you have not a bona-fide interest in these bulletins—please do not send for them.

Please send a copy of your new "X-RAY" Bulletin to—

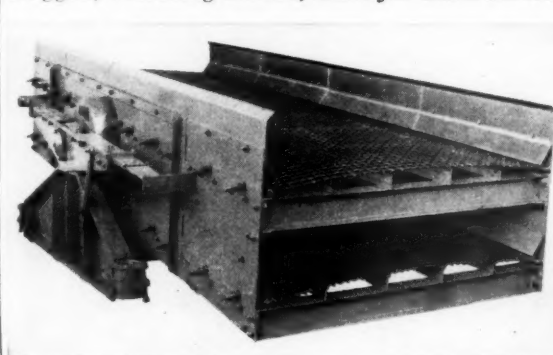
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Passaic, N. J.

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Robins-Gyrex, product of Robins Conveying Belt Company

Robins-Built Screen Line Is Complete

6 Different Types Cover Entire Screening Range

PASSAIC, N. J.—In addition to the GYREX, Robins Conveying Belt Company manufactures the VIBREX, a high speed, unbalanced vibrator for fine sizing. Bulletin No. 118 describes this popular unit.

The ROBINS-ELIPTEX Screen is ideal for horizontal installations where headroom is limited, or for dewatering service. Bulletin No. 111.

ROBINS-LIQUID Screens for clarifying liquids or dewatering solids are used in dozens of highly diversified applications in the process industries. Bulletin No. 107.

The ROBINS-CONTRACTOR'S Screen is a small, portable, general purpose unit. Bulletin No. 110.

ROBINS FOUNDRY SHAKEOUT Screens are made for both continuous or pick-up operation.

9 Reasons for GYREX Popularity

These Features Fully Described in X-Ray Bulletin

PASSAIC, N. J.—The following are reasons why so many hundreds of operators choose GYREX Screens:

1. Simplicity of design, the result of experienced engineering—means RELIABLE PERFORMANCE.
2. Super-sealed bearings and heavy duty structure—for LOWER MAINTENANCE.
3. Central vibrator location and balanced stabilizing springs, insuring uniform, positive motion—a guarantee of HIGH CAPACITY and EFFICIENCY.
4. Minimum number of easily accessible cloth attachment bolts and ability to flatten live frame to clear chutes—providing SPEEDY CLOTH CHANGE.
5. Positive eccentric shaft and massive anvil-type base frame—which means ABILITY TO STAND UP TO OVERLOADS.
6. Easy access to mechanical parts and guaranteed interchangeability of replacements—make GYREX EASY TO SERVICE.
7. Spring tensioned cloth supported on rubber cushioned arched frame prevents whipping and crystallization—providing LONG CLOTH LIFE.
8. Screw adjusted counter-balance weights—which mean PERFECT BALANCE WITH NO ESCAPING VIBRATION.

Gyrex Famous in Many Fields

Versatile Screen Is Positive Stroke Circle-Throw Type

PASSAIC, N. J.—Unsurpassed in versatility of application and in stamina, ROBINS-GYREX Screens are built in a complete range of sizes from 24" x 54" to 72" x 192". The latter are the largest and heaviest vibrating screens in the world. (See picture below). Standard units are available with one, two or three decks; with heavy, cast base and angle adjustment for floor mounting or with steel base for suspended or rigid mounting.

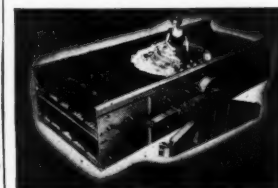
Quick-Change Attachment

This special feature available on GYREX Screens cuts the time required for cloth changes to an absolute minimum. It is a particular boon to operators who must change cloth frequently to produce products of varying specifications.

Robins Screen Cloth

New Robins Bulletin No. 113 is a fact-full illustrated story of the complete selection of Robins Woven Wire Cloth for Vibrating Screens. The bulletin contains helpful data on cloth specifications, wire diameter, comparison of round with square openings, etc. Pictures of various Robins weaves and cloth-holding methods are also shown. Copies of Bulletin No. 113 are available without charge.

World's Largest Screen



This picture was taken at Robins Passaic, N. J. works. The Screen is a ROBINS-GYREX 72" x 192".

9. The wide range of sizes and styles available enables Robins engineers, guided by their broad background of experience, to make the most suitable recommendations—making certain of PROPER APPLICATION.

MINING CONGRESS JOURNAL

Vol. 28

MARCH, 1942

No. 3

... And From

DONALD M. NELSON

Chairman of the War Production Board

"The patriotic spirit which prompted your pledge of support to our Government in its war production effort is indeed appreciated and we are glad to know of your splendid cooperation."

THE AMERICAN MINING CONGRESS assembled at Cleveland, Ohio, upon the 6th day of February, 1942, pledges its complete cooperation to the task of carrying the war to a successful conclusion.

Minerals are of such vital necessity that we urge full recognition by management, labor and stockholders of the responsibility which each must accept in order that maximum production be obtained.

New and high cost mineral production must be encouraged. The Government has assumed responsibility for the methods by which this shall be done. The mining industry, whatever its views as to the effectiveness of the methods, will assist to the fullest extent.

Production for war needs is of first importance. To this end the mining industry reaffirms its position on the necessity of equitable employe-employer relationship, sound fiscal policies, the elimination of non-essential Government expenditures, and other matters which are essential to the successful prosecution of the war and the preservation of our American way of life.

The mining industry pledges itself to work and produce for Victory.

THE WHITE HOUSE
WASHINGTON

February 19, 1942

My dear Mr. Conover:

The President has received your letter of February thirteenth, embodying the text of a Declaration adopted at the 44th Annual Meeting of the American Mining Congress. For this splendid assurance of loyal support in our common effort he is more appreciative than he can say. Such voluntary and wholehearted patriotic pledges mean much to him in these critical days and serve to bulwark his determination to carry out the will of the American people.

In thanking you for your courtesy in the transmittal of this Declaration, may I assure you that these expressions on the part of the American Mining Congress will receive most careful consideration.

Very sincerely yours,



M. H. MCINTYRE,
Secretary to the President

Julian D. Conover, Esq.,
Secretary,
The American Mining Congress,
Munsey Building, Washington, D. C.



New
tippie
and
preparation
plant

PREPARATION PLANT of the Dawson Daylight Coal Co.

THE Dawson Daylight Coal Company of Dawson Springs, Ky., experienced the second complete loss by fire of its wooden tippie on November 15, 1940, and after this second destructive occurrence, it was decided to replace the wooden structure with a steel tippie. Our sales and operating departments prepared plans and screening specifications for primary separation by shaking screens and secondary preparation by vibrators; these plans were submitted to the engineering firm of Templeton-Matthews Corp., of Terre Haute, Ind., who were engaged for designing and engineering the new structure. The installation was completed in the latter part of August, 1941, and following pages show the flow sheet and sizes which can be prepared and loaded on the tippie tracks.

Shaker Screens Make Primary Separation

In order to shorten construction time and overcome delays resulting from scarcity of fabrication material, it was decided to purchase a used steel tippie for the primary plant. This was secured from a mine in the neighborhood of Dawson Springs, Ky., and in addition to the steel framework, included shaking screens, three

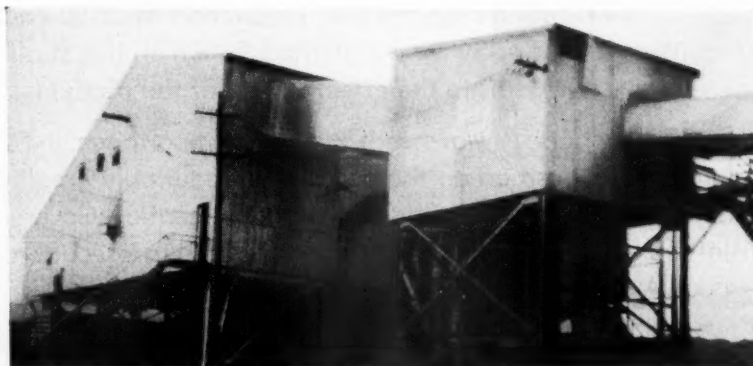
By **W. J. BORRIES**

General Manager
Dawson Daylight Coal Company

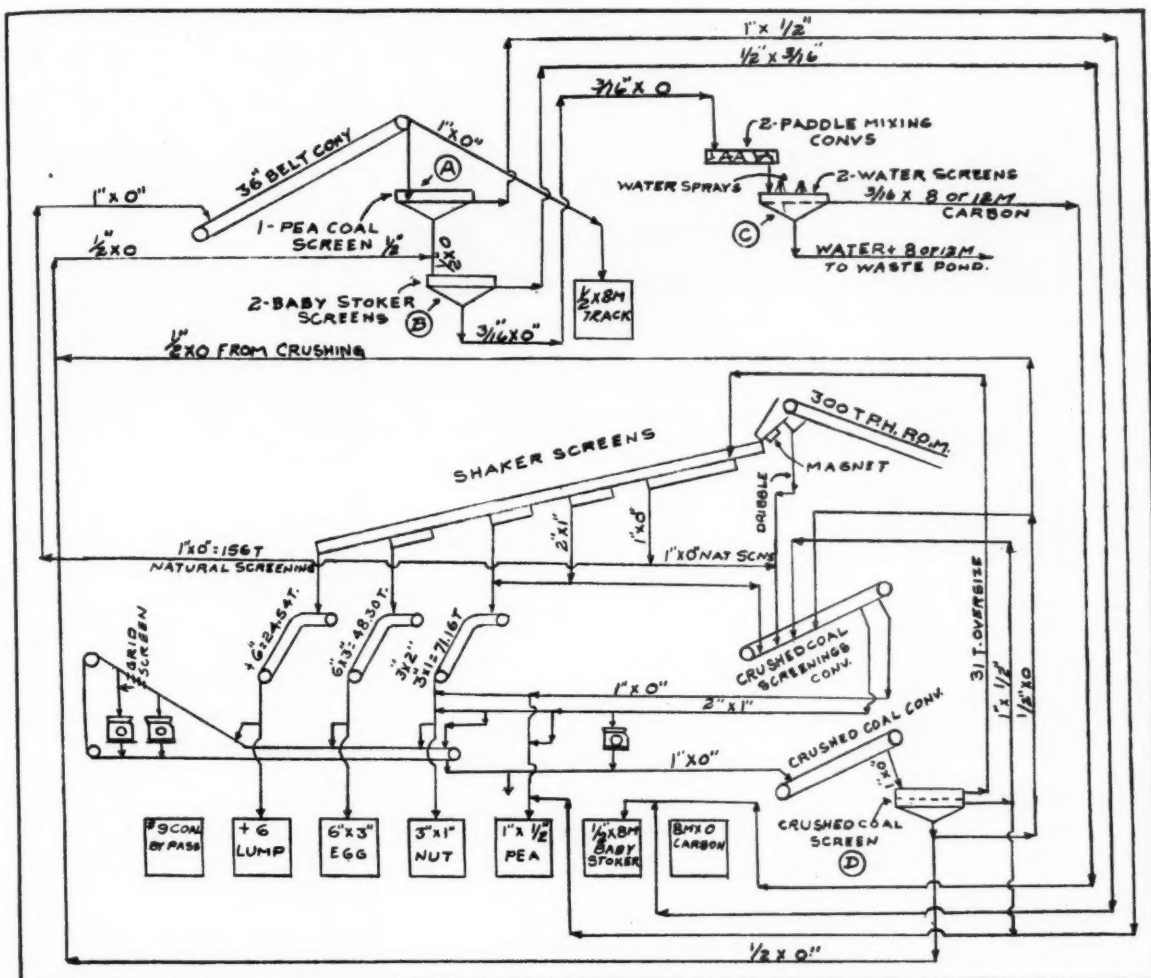
loading booms and loading facilities for the nut and smaller screenings. The material was dismantled at its location in West Kentucky and was moved to our property where the steel building was erected, using riveted construction. The secondary plant for the vibrating screens has new and some used steel for its framework which is of welded construction.

The primary plant consists of 8 ft. shaker screens to separate the coal into

the usual five major classifications of lump, egg, nut, pea and slack, which can all be loaded directly into railroad cars on the five tippie tracks. In addition, the revised design provides for loading 8 mesh "carbon" into cars on the passing track, when that becomes desirable. The shaker screens are supplemented by the secondary or rescreening section of the tippie which was added to the original installation, in order to give bet-



Head of belt conveyor from mine



Flow diagram of primary and secondary screening

ter preparation for special fuels and stoker sizes and also to increase the recovery of marketable fine coal.

Vibrators for Complete Preparation

The secondary plant includes a series of six Tyler Ty-Rock 5 ft. x 14 ft. vibrator screens, marked (A), (B), (C) and (D) on the flow sheet. The first one of this series, (A), is placed directly under the shakers and receives the 1 in. x 0 screenings; these are passed over a 1/2 in. mesh cloth and the 1 in. x 1/2 in. over-product is loaded into railroad cars as pea coal. The 1/2 in. x 0 through-product is taken by a drag conveyor to the upper floors of the tipple where there are four vibrator screens (B) and (C) that prepare a 1/2 in. x 8M product, known locally as "Baby Stoker" coal.

The Baby Stoker is screened in two

stages. The 1/2 in. x 0 feeds to a battery of two vibrators, marked (B), having 3/16 in. wire cloth; the 1/2 in. x 3/16 in. over-product goes to the railroad cars and the minus 3/16 in. through-product goes to another battery of two vibrators, marked (C). These vibrators have 8M or 12M wire cloth and the coal, during the screening, is subjected to numerous water sprays at 25 lb. pressure. The water sprays serve to give complete separation by washing the fines through the screen; these fines contain mother coal and other small impurities which are taken by a centrifugal pump to an outside settling pond for waste disposal. The 3/16 in. x 8M or 12M over-product can be mixed with the 1/2 in. x 3/16 in. from the preceding vibrators (B) and loaded into railroad cars to make a final product of 1/2 in. x 8M "Baby Stoker." If "carbon" is desired, the 3/16 in. x 0 from

vibrators B is taken dry by the carbon conveyor to the 6th railroad loading track (passing track) without screening over vibrators C.

It may be of interest to know that the water sprays have been very effective in the small size separation. The recovery of the near 8M or 12M coal has reduced the amount of marketable fuel that was formerly wasted and the removal of small particles of impurities has resulted in a decided improvement in the quality of the plus 8M prepared product.

Crushing and Blending for Special Stoker Sizes

Our stoker coal is also made from crushed lump, egg and nut sizes. The loading booms from any of these three screens may be elevated to discharge onto a mixing conveyor which takes this product to two crushers as shown



Wood construction is being replaced by steel

on the flow sheet. Between these crushers, in a circuit with the mixing conveyor, is a grid screen with variable openings so as to allow certain proportions of the mixture to go to the first or "nut" crusher, and the oversize passes to the second or "egg and lump" crusher. This crushed product may either be loaded direct into railroad cars or sent to the rescreening plant.

When sent to the rescreening plant the coal is discharged onto a conveyor (marked "Crushed Coal Conv." on the flow sheet) and elevated to the top of the building where it is fed onto a 5 ft. x 14 ft. vibrator screen marked (D). This screen is double-decked, and the top deck with 1 in. or 1½ in. openings picks out the desired oversize which is conveyed back onto the shaker screens. The lower deck has a ¾ in. opening and the intermediate product of ¾ in. x 1 in. or 1½ in., or whatever it might be, is diverted to the pea coal railroad track. The minus ¾ in. product goes to the stoker coal drag conveyor (as previously mentioned) which delivers to the Baby Stoker vibrators in the secondary system. In this manner the crushed coal may be added to the product from the primary screening to combine and make stoker fuels of various sizes.

Mechanical Loading Underground

The mine operates the No. 6 seam, and the coal is brought to the tippie by a conveyor belt 36 in. wide and approximately 1,000 ft. in length. This belt conveyor extends from the tippie to an underground hopper where the mine cars are dumped over a rotary dump. Trips of 22 mine cars aggregating about 70 tons are hauled to this point by a main line locomotive; further underground a shuttle locomotive assembles the main line trips by gathering the cars from the mechanical loading and conveyor sections.

Our underground mechanical equip-

ment includes eight Goodman duck-bill loaders with shaker conveyors and one Joy mobile loading machine. The production is approximately 1200 tons per shift of 7 hours, but the tippie is capable of handling, and is designed for, 300 tons per hour.

Railroad Car Loading Facilities

Lump Track—Loading Boom

- + 6 in. lump
- + 3 in. lump
- + 1 in. lump
- 1 in. x 0 crushed
- 1 in. x 0 screenings
- 1½ in. x 1 in. small nut

Egg Track—Loading Boom

- 6 in. x 3 in. egg
- 6 in. x 2 in. egg
- 6 in. x 0
- 1 in. x 0 crushed
- 1 in. x 0 screenings
- 1½ in. x 1 in. small nut

Nut Track—Loading Boom

- 3 in. x 1 in. nut
- 3 in. x 1½ in.
- 3 in. x 0
- 1 in. x 0 screenings
- 1½ in. x 0
- 1½ in. x 1 in. small nut
- 1 in. x 0 crushed

Pea Coal Track

- 1 in. x ½ in.
- 1½ in. x ½ in.
- ½ in. x 0 in.
- 1 in. x 0 crushed
- 1 in. x 0 screenings
- 1½ in. x 0 crushed
- 1½ in. x 0 screenings

Baby Stoker Track

- ½ in. x 9 mesh
- ½ in. x 12 mesh
- 1 in. x 8 mesh
- 1 in. x 12 mesh
- 1½ in. x 8 mesh
- 1½ in. x 12 mesh

Carbon—Passing Track

- 8 mesh or 12 mesh
- 3/16 in. x 8 or 12 mesh

Coal Production Can Be Increased

The demands of war will with certainty call for an even greater production of coal in 1942 than the large total already achieved in 1941. Recently W. DuB. Brookings, manager of the national resources department of the U. S. Chamber of Commerce said that this can be achieved through establishment of an eight-hour shift in the mines. He added:

"The approximate production of coal for the year 1941 was 500 million tons, which is an increase of approximately 10 percent over last year. This will represent the largest bituminous coal production for any calendar year since 1929, when 535 million tons were produced. Should the demand run up to 560 million tons in 1942 the industry should still be able to meet requirements.

"It should not be overlooked that in the coal industry there is great opportunity to expand production, since most mines operate on a basis of two 7-hour shifts of 35 hours per week. The 5-day week, 7-hour shift was made effective during a period of low production when there was a widespread desire to keep miners at work. An 8-hour shift, properly applied, would make it possible to increase production by approximately five million tons a month."

Mine Warfare Course Started

Mine warfare is emphasized in a course on elements of mining which is being given for the first time this semester by members of the staff of the Department of Mining Engineering, the Pennsylvania State College. Forty-five students are enrolled, many of whom are senior students in the Reserve Officer Training Corps at the College. Engineer officers of the Department of Military Science and Tactics at the college are cooperating in giving the course.

Detection of enemy mining activity; explosives; approved safety practices for handling explosives; practice in using blasting accessories and preparing charges; demolition; construction, and removal of land mines are some of the topics covered.

The students are also taught mine gas detection and rescue operations; excavations and their support; and excavating practices and machinery. Each student is required in the laboratory to demonstrate his ability to make up primers and to calculate, lay out, connect, and test blasting circuits and charges according to approved safety practices; to place standard timber sets; and to detect gases likely to be encountered in excavations and mines.

Although the course is designed to better prepare students for service in the armed forces, much of its subject matter is usable in peace time.

Material useful in civilian life covers such items as the use of explosives in land clearing, land reclamation, road construction, ditch digging, pole setting, scraping machinery; in blasting of oil, gas, and water wells; and in pipe line construction.

BLOCK CAVING With Slusher Hoists and Scrapers

- *Mr. Sirkegian gives a very complete and informative account of the use of slusher hoists and scrapers under varying conditions, as experienced in block cave mining at the Emma Nevada mine of Consolidated Coppermines Corporation at Kimberly, Nev.*



By **PAUL J. SIRKEGIAN**
General Superintendent
Consolidated Coppermines Corp.

THE Emma Nevada ore body is one of the portions of the several so-called disseminated copper ore deposits occurring in the monzonite porphyry of the Robinson Mining District of Ely, Nev. The ore body, as outlined by borehole (churn drill) exploration to date, occurs in a blanket-like form, with an undulating top and bottom contour, averaging about 170 to 175 feet in thickness. The mineralization occurred subsequently to the original intrusion and cooling of the porphyry and it followed certain heavily fractured and shattered zones within the mass. The copper mineral is chalcopryite, which is distributed fairly evenly throughout the mineralized area. The ore body in general is quite thoroughly fractured and altered and soft, which permits mining by block caving methods. A younger monzonite porphyry, locally referred to as "peanut porphyry," underlies the ore-bearing porphyry, which in turn rests on limestone and shale sedimentaries.

Mine openings in either porphyry require heavy timbering, particularly in horizons near the contact, and in some instances in horizons at appreciable distances from the contact. The waste material overlying the ore body is unmineralized porphyry, sedimentary remnants or pendants, and irregular bodies of barren post-mineral rhyolite. The rhyolite often intrudes and underlies the ore and in some areas, particularly along the ore-body fringes, its occurrence seriously affects the grade of the ores being drawn.

The accompanying sketch (Figure 1) shows a general section of the ore body taken along its longest axis, which lies roughly in an easterly-westerly direction.

Orebody Varies in Section

It may be noted from the sketch that some portions of the ore body are relatively thin and high-lying in respect to the horizon of the main haulageways. Portions of the ore body that are approximately 150 ft. thick or over and whose bottom contours are from 60 to 100 ft. above the main haulageways are mined by branch raise methods of block caving. Lowest overall mining costs have been experienced by this method in sections of the ore body which

usually are mined by slushing methods. Some variations of this practice are followed, particularly for the low-lying ores that may have thicknesses greater than that of the average. In such cases the ores are first mined by

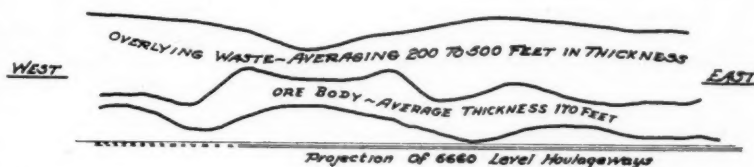


FIGURE 1. General Easterly-Westerly Section Emma Nevada Orebody As Explored To Date December 1-1938

LOOKING NORTH

SCALE - 1 INCH = 500 FEET

generally fulfil the above physical conditions.

In general, all mine openings are by necessity heavily timbered and the "draw" openings referred to as "fingers" are spaced at 15-ft. intervals in the horizons at the bottom of the ores. The bottom contact of the undulating ore body varies in elevation from within a few feet of the main haulageway to that of 200 ft. above this horizon. Blocks of the ore whose bottom contacts are less than 60 ft. above the main haulageways and those that are above 100 ft.

branch raise methods followed by slushing methods from the main haulage horizon in order to salvage the remaining ores below the mining or undercutting horizon which is at a minimum distance of about 60 ft. above the main haulageway. However, it is always desirable to mine all of the ore in one step if it is economical to do so. Slusher methods of mining effect initial savings in preparatory cost, but the disadvantage and increased cost, particularly in heavy ground, requires longer time of maintenance for the completion of

mining of the thicker overlying ores. These costs, plus the extra cost of horizontal transportation of ores by slushers, together with the possibility of tying up an entire slusher drift for a considerable length of time because of timber failure near the slusher hoist, in some instances outweigh the extra cost of mining the ores first by gravity methods followed by the salvaging procedure.

Slushing drifts driven from at or near the haulageway horizon lack sufficient storage capacity to insure quick and efficient loading to the mine cars. The longer time required for loading because of insufficient storage is a serious problem if the slow loading interferes with regular train movements.

The ore in most areas of the mine, after undercutting has been completed at the draw point or finger horizon, caves at a certain rate regardless of its thickness. The practice as developed at this mine in the block caving operations is to make every effort to draw the ore as fast as it caves and breaks up. If the ore is drawn at a faster rate, voids will be created over the broken mass and the eventual sudden collapse of the unbroken material may have serious consequences. On the other hand, if the ore is drawn at too slow a rate the caved and broken mass will pack, causing undue weight on the supporting timbers and poor extraction results. These principles are recognized in all of the block caving operations in the mine.

Slushing Methods Developed for These Conditions

Two methods, known as standard slushing and sublevel slushing, have been developed for the extraction of high-lying ores. Standard slushing as applied to the high-lying ores is illustrated by Figure 2. That applied to the low-lying ores is illustrated by Figure 3. Sublevel slushing or sub-control mining applicable only to high-lying ores is illustrated by Figure 4. Standard slushing applied at the ore-body fringes to take advantage of the extreme branch raises that have already served their purposes in order to further minimize the cost of the preparatory work is shown by Figure 5. Cross slushing high-lying ores that are mined by standard slushing methods is shown by Figure 6.

Regardless of the thickness of the overlying ore, the same amount of preparatory work of providing "draw points" or fingers on 15-ft. centers

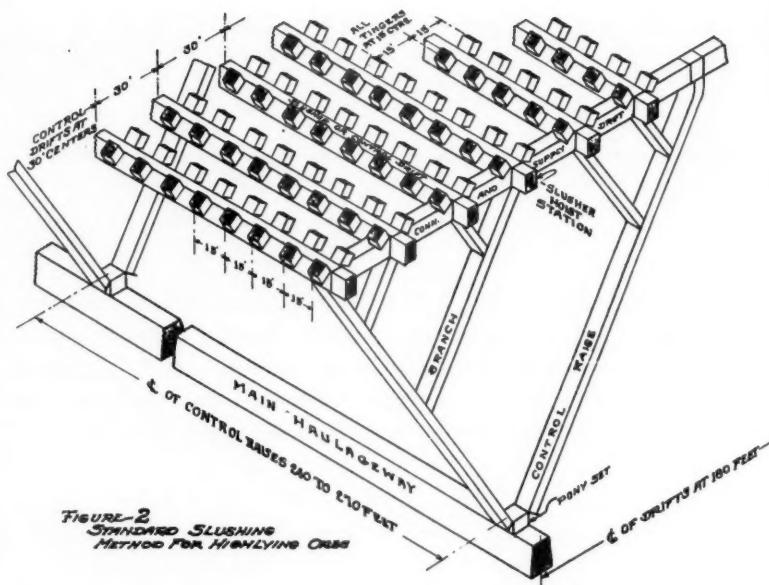


FIGURE 2
STANDARD SLUSHING
METHOD FOR HIGH-LYING ORES

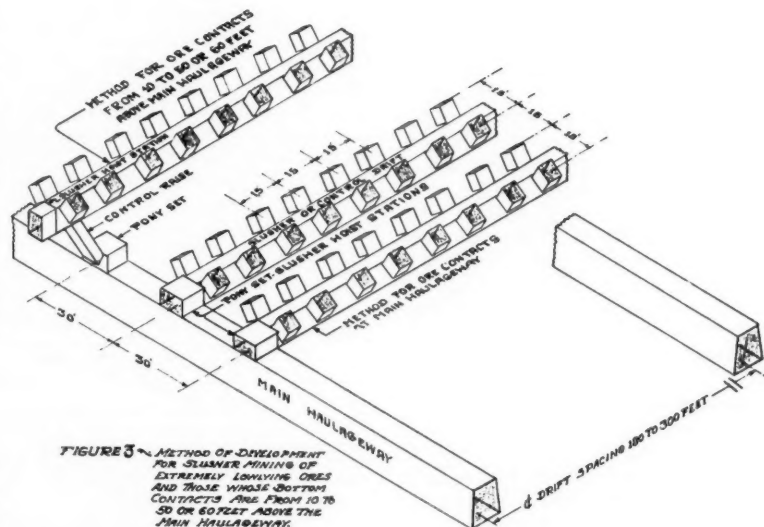


FIGURE 3
METHOD OF DEVELOPMENT
FOR SLUSHER MINING OF
EXTREMELY LOW-LYING ORES
AND THOSE WHOLE BOTTOM
CONTACTS ARE FROM 10 TO
30 OR 60 FEET ABOVE THE
MAIN HAULAGEWAY

is necessary for the successful extraction of ore from any block or area in the mine. The prime reason for the adoption of the slusher mining method is because of its applicability in certain sections of the mine to provide cheaply the necessary draw point pattern of preparatory work beneath the block of ore to be mined. Essentially, the preparatory development costs plus the extra cost of transporting the broken ores horizontally to sparsely spaced control raises or ore passes driven from the main haulage level should be less than that of providing the "draw point" pattern above more closely spaced branch raises

driven from the main haulage level through which the ore is moved entirely by gravity. Secondly, the slushing method eliminates close main drift spacing, and this element of cost savings must also be taken into consideration. Choice of the mining method is not, however, based wholly upon the above reasoning. The structural condition of the ground in the zone immediately above and below the ore body bottom contact must be considered. The ground at the ore contact is generally heavy and difficult to hold due to the shattered condition of the ore body and the footwall in close proximity to the contact. A

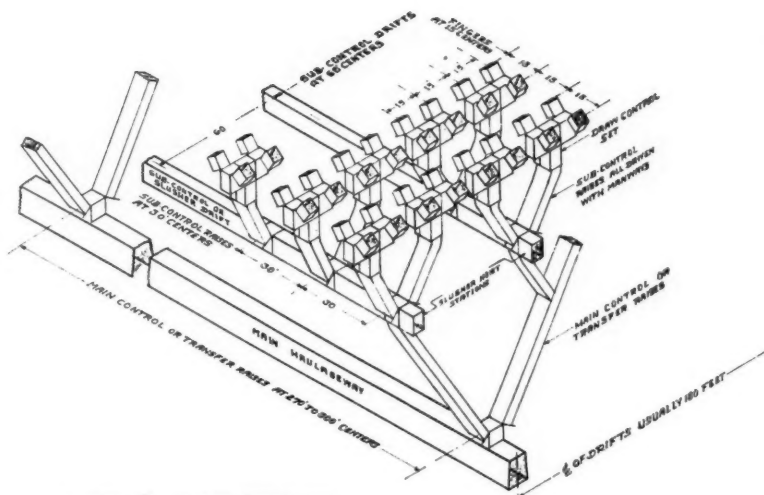


FIGURE 4—Sub-Control Mining Method

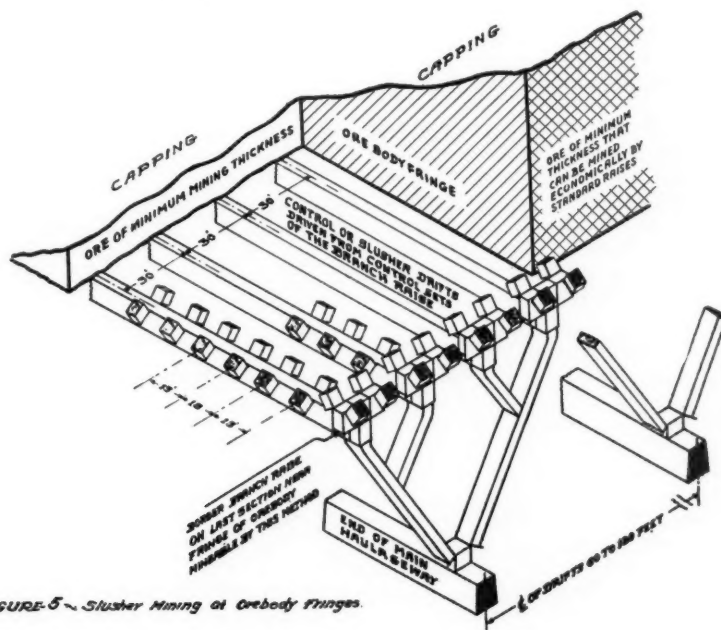


FIGURE 5—Slusher Mining at Orebody Fringes

zone, averaging anywhere from 2 or 3 ft. to as much as 12 or 15 ft. thick immediately below the ore contact, carries much gouge, locally referred to as "chewing-gum gouge."

In certain areas where this material is of appreciable thickness the problem of repair and maintenance becomes quite a serious one and in some extreme instances it has become impossible to hold the openings in this horizon long enough to mine the overlying ores. Mining methods are varied to suit the particular conditions encountered in each block. Slusher mining has proven to be the most economical method devised for the mining of the thin, highlyling ores which

would require excessive branch raising if developed for conventional block caving methods. As stated above, the cost of mechanically moving the ore must be balanced against savings in development costs, but when the ore body is thin these savings more than offset the cost of slushing.

Prior to making a final decision on the mining method to be used in a particular block, a comparative analytical study is made of all available data. The statement made heretofore that lowest overall mining costs have been experienced by branch raise caving methods may be briefly explained. All branch raise methods are carried on in areas where the ore-body bottom

is at ideal distances above the haulage level (generally 60 to 100 ft.) and where the ore is usually greater than 150 ft. in thickness. Attention may be called to the fact that slusher mining is generally used in places where the less favorable conditions exist, such as thinner fringe areas and areas where the ore is high above the main haulage way.

Practice in Installation of Slusher Drifts

In order to minimize repair and maintenance the slusher drifts are installed as small in cross section as is possible satisfactorily to work through, and consequently the size of scrapers is limited. Slusher drifts under most conditions are driven 5 ft. by 6 ft. in the clear inside of the timbers. The timber used is Douglas fir 12 in. by 14 in. in section for vertical posts, caps and sills. A 6-piece segment set made of 4-in. by 12-in. Douglas fir is placed inside of each drift set in order further to strengthen it. It has been found necessary to use a segment set in nearly all of the slusher drifts. Red fir and yellow pine split lagging are used for covers and sides.

A number of different methods of timbering have been tried but this particular method has proven to be the most satisfactory. In some instances where extremely swelling ground was encountered the sill has been omitted and the posts placed with an 18-in. batter using a post length of 6 ft. 6 in. instead of the standardized 6-ft. vertical post, thus allowing the ground from the bottom to swell and heave. By careful supervision the floor level has been maintained by utilizing the slusher to scrape off the heaving ground. The standard practice in all other instances now is to lay two 16-lb. rails spaced by 2-in. by 12-in. planks along the full length of the slusher drift. The bottom of the slusher drift prepared in this manner provides a good, durable, smooth floor which aids in appreciably decreasing peak power loads on the slusher hoists. Slusher drifts have been driven in varying lengths up to a maximum of 180 ft. Longer slusher drifts effect maximum savings in preparatory development costs, but increase other adverse operating factors.

The length of the slusher drifts has a direct bearing on the economy and success of the method, as savings in main level and raise headings are increased as the slusher drifts are lengthened. It has been found that about 120 ft. is the most economical length,

Experience has shown that for the best results slusher drifts should be driven nearly horizontally. The maximum grade used is a 4-in. rise per 5-ft. set. Steeper grades cause sets to ride up grade and are difficult to maintain. The draw fingers in the slusher drifts are identical to those in the branch raise methods. The fingers are timbered 5 ft. in length with 8-in. by 8-in. cribbing resting on 10-in. by 10-in. bearers. The inside section size of the finger or draw point is 3 ft. by 3 ft.

Heavy cast scrapers of various makes equipped with manganese wearing surfaces have been used, but it has been found that a hoe-type scraper designed and fabricated in the corporation's shops is the cheapest and best for the ores of this mine. These scrapers are constructed with abrasion resisting steels of high tensile strength and are much lighter in weight than those that are constructed of castings. In passing, it may be worthwhile to describe briefly the general character of the Emma Nevada mine ores. The very shattered nature of the material causes it to break down very fine even during the first handling at the mining horizon. After the ore is transferred down through the control raises and into the mine cars and on through the underground pockets, hoisting skips, the surface ore bins, and railroad cars it is so well broken down that about 60 percent of it will pass through a 1 in. mesh screen and a considerable portion would pass through a 65 mesh screen. The ore carries better than 70 percent silica and even in the first handling it is broken down fine enough to make a very effective grinding compound. The scrapers constructed in Consolidated Coppermines' shops are reinforced at points of greatest wear by application of various types of hard surfacing alloys. It has been recog-

FIGURE-6
CROSS SLUSHING HIGHLYING
ORES MINED BY STANDARD
SLUSHING METHODS

The cast scrapers are used oftentimes during the development stage but are replaced by the homemade type as soon as production is started. The homemade scraper has the ability to dig into the ore and carry a larger load than that carried by the cast scraper. The standard scraper width is 42 in., although 48-in. and 60-in. scrapers have been used in areas where ground conditions at considerable distances below the ore body were good and slusher drifts of larger cross section were driven. However, very few of these larger scrapers have been used because of the scarcity of permissible areas.

The slusher hoists are double-drum electric tuggers of standard manufacture in 15 and 20 hp. sizes. The power used is 550 volts, 3 phase, 60 cycle alternating current. Rope pull is 2,200 to 2,500 pounds. Loaded speed is 200 ft. per minute on the 15 hp. units and 280 to 300 ft. per minute on the 20 hp. units. The 20 hp. units are used chiefly in the subslusher drifts, which serve an area twice that of a standard slushing drift. The 20

Under the most favorable conditions one 20 hp. slusher unit with a 48-in. scraper has delivered 750 tons in 7 hours of actual operation. However, the average tonnage throughout the operations of the entire mine is around 300 tons per slusher shift, which takes in the slushing operations in all types of ground and conditions and all types of slusher hoists and scrapers used. Under average conditions in the mine the above slusher hoists and scrapers are large enough easily to remove the ore as fast as it caves in the particular area being mined by this method. The slushing routine at the Emma Nevada mine offers no information as to what daily tonnages the slusher hoists could handle if continuous slushing were practiced. The actual operation is intermittent finger drawing, slushing and repair work and the tonnage to be drawn is governed by the rate at

which the ore caves. The average tonnage of 300 tons per slusher shift is obtained during the actual slushing time of between 4 and 5 hours.

Ropes and Sheaves are Carefully Selected

Many different types of wire ropes have been used, and performance data have been carefully recorded. The best results thus far have been obtained with $\frac{1}{2}$ in. and $\frac{3}{8}$ in. 6 by 19 regular lay preformed improved plow steel ropes with hemp center. Broken ropes are spliced by men designated for this work, who are responsible for the general care and lubrication of the slushing equipment. Ropes are sometimes knotted only as a temporary measure, as a knotted rope piles up on a hoist drum, snags in the sheave blocks and hastens wear and breakage. For rush jobs it is necessary at times to splice a rope at the working place and they are usually spliced with a short temporary running splice locally called a "Molly Hogan." Generally, all broken ropes are spliced in the underground shop with long running splices of 10 to 15 ft. The practice is also followed of making up ropes out of salvage pieces. This procedure has been found to be economical. The rope splicers' tools consist of a soft hammer, a cold cut chisel and a pair of marlin spikes.

Sheave blocks used on tail ropes under average conditions are standardized to 10-in. diameter sizes. Several types of standard manufacture are used and it has been found that the very best grade of blocks running on sealed bearings which require little or no attention has proven the most economical. The 10 in. sheave blocks are anchored to a specially designed spring "eye" bolt developed locally. The anchor bolt was primarily designed to take a considerable amount of shock off the rope. Under the most favorable conditions where it is anticipated that a particular slusher drift will be kept open in its entirety until the overlying ores are completely mined, a large stationary 24-in. diameter sheave wheel is used. Under the average conditions such installations are not practical because of the necessity of moving the sheave from place to place to accommodate repairs and maintenance. Several types of 4-in. and 6-in. "snatch" blocks of popular manufacture have been used for rope guides. These have been largely replaced by more rigid and efficient sets of roller guides developed locally. These guides have proven to be prac-

tically "foolproof" during the life of the slusher drift and have appreciably increased rope efficiency. A recent six months' study of rope efficiency data disclosed one figure that may be of interest. The ropes used for ore slushing were consumed at the rate of 1 ft. for about every 60 tons of ore mined. However, the tonnage a rope will deliver depends largely upon the skill and efficiency of the slusher hoist operator. The ability of hoist operators vary greatly, and efficiency data have shown that the variations of rope consumption range from 1 ft. for 10 tons to as much as 1 ft. for 1,000 tons delivered. The two extremes of variations are exceptional cases where local conditions were also important factors. In general, slusher operators, until properly trained through experience and constant supervision and instruction, will allow the slusher ropes to lie in puddled water or wet ore, and corrode, and in some instances the operator will allow the rope to be unduly buried in the abrasive ore, which hastens its destruction. In a few cases shiftless operators have been discharged for deliberately sawing a boulder on the grizzlies with the slusher rope because they did not feel inclined to take a moment or two to do a little hand work to break it up. In most areas of the mine occasional runs of wet, sticky and "soupy" ores occur which at times will completely fill the slusher drift and bury the ropes and scraper, and unless the operator is very skillful he will invariably ruin the ropes in cleaning out the drift.

Experience with Conveyors

Shaker type conveyors have been tried in the mine, but their applicability in the operations have been precluded by reason of two major physical factors. First, because of the general heavy ground conditions discussed heretofore and, secondly, because of the occasional runs of wet, sticky and "soupy" ores.

The conveyor, which is quite a bulky and complicated piece of equipment as compared to a rugged slusher hoist and scraper, is a cumbersome unit to get out of the way when the ground starts to squeeze and heave and displace the sides, roof and bottom of the drift out of alignment. This action of the ground is generally expected in most areas of the mine and it is the practice to continue operating a slusher hoist while the repair

work is going on. Oftentimes a narrower scraper is used while repair work progresses, but, nevertheless, the work can continue in the quickest possible time. A conveyor installed under such conditions, when heaving and displacement takes place, is in considerable distress and must be removed immediately. Experience has shown that when conditions are ideal a conveyor will handle the ore more rapidly than a slusher in the same or even narrower drift cross section. However, the increase in transportation speed is not necessary because practice has definitely proven that a slusher hoist and scraper can easily handle the ore as fast as it caves. Experience has also shown that the conveyor cannot handle the occasional runs of wet ores, whereas a slusher hoist and scraper can. From experiences gained, it has been concluded that it would be impractical and economically impossible to use any type of conveyor to replace slusher hoists and scrapers as long as these conditions exist.

Some Conclusions May be Drawn

The chief advantages of slusher and sub-slusher methods of mining as compared to conventional block caving methods are mainly represented by savings in preparatory development expenditures. The success in ore extraction by this method depends upon the same kind of care and routine necessary in controlling the draw in conventional block caving methods. Methods of applying engineering skill in mining layouts and sequences follow closely to that of many other successful block caving operations. The easier access to the actual mining horizon that is gained, where the slusher method of mining is adaptable, is an important advantage because of better supervision, better ventilation and safety.

Geophysics Volume Published

The Colorado School of Mines has published "Geophysics in War," Volume 37, Number 1, of the School of Mines Quarterly. The author is Dr. C. A. Heiland, professor of geophysics. Comprising nearly 100 pages, the discussion is divided into two major parts: (1) Military Operations and (2) Mineral Resources. Included are 47 photographs, diagrams, and charts; some taken from previous literature and others published for the first time.

All of the important uses of geophysics both in military operation and in the location of strategic and critical minerals are discussed.

Hydrogen From LIGNITE

The coal and lignite resources of the country present a virtually inexhaustible supply of raw materials for many chemical products. The process described here, and proved in the pilot stage, can be employed to utilize the lignites of the Dakotas to produce a wide variety of wartime and peacetime chemicals.



By W. B. PRATT

Treasurer
Dakota Collieries Co.

A nation at war must not depend on outmoded methods to secure vital materials. We must use every effort to secure needed basic materials as cheaply and as quickly as possible.

For several years Professor L. H. Ryerson, of the University of Minnesota, and his associates have been studying the problem of lignite coal. They have successfully developed an economical process of securing hydrogen from the raw lignite.

Lignite is a low B.T.U., high-moisture coal. By subjecting this to a low-temperature carbonization certain tars and char are produced. For the purpose of securing hydrogen, the char is treated with steam and large volumes of hydrogen are liberated. This is a low-cost process. The hydrogen is purified and in the process yields methyl-alcohol. This is a by-product, but is important as it is a base for formaldehydes and some plastics.

Ammonia is One of the Important Products

By combining nitrogen from the air with the hydrogen, under proper conditions and using the proper catalysts, ammonia is produced. This is the most important use of the hydrogen, as ammonia is the base of a good many other necessary chemical compounds. Ammonia burned over a catalyst in the presence of excess air forms nitric acid. This mixed with sulphuric acid and added to alpha cellulose, from northern Minnesota aspen, forms guncotton, celluloid or collodion, depending on the proportions used.

During war time the most important product of this process is ammonium nitrate. It would be supplied to shell-loading plants in the Central States. Various types of explosives, such as tri-nitro-toluene (T.N.T.),

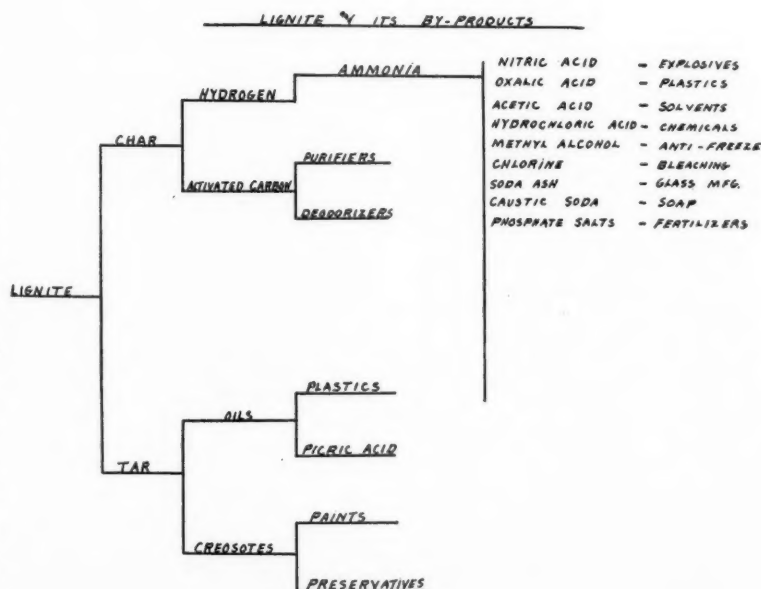
can be made from this as a starting point.

The char itself can be activated for use in water purification, gas masks, purification of sugar, drugs, acids, and various other branches of the chemical industry as purifiers or deodorizers. Lignite char is now being produced in Texas for such uses. Char which is not utilized in the production of hydrogen or which is not activated will be available for use as fuel or briquets. It has been proven that this char makes excellent high-quality briquets and, as a by-product, this would be an excellent source of revenue. They could be sold either at the char plant in North Dakota or in the Twin City area.

The figures on production are interesting because they give an idea of the complete utilization of a fuel which now is used very inefficiently. About 2 tons of lignite are needed

for 1 ton of char. In order to secure hydrogen sufficient for 1 ton of ammonia it is necessary to use about $1\frac{1}{2}$ tons of char. Ammonia and methanol are produced. Estimates indicate that the cost of ammonia would be approximately 2.5 cents per pound; this is a low cost. Moreover, the finished product is near the points where it will be used, thereby reducing transportation costs.

We should take advantage of a new process and low cost. The process is economically feasible. It has been checked and rechecked. A pilot plant has been in operation for over a year



and commercial scale tests have recently proved very successful.

Products Will be Needed in the Post-War World

But the war cannot last forever and there is the question as to the value of this process in the future economic picture. Ammonia, once again, is the starting point for products used in the chemical, plastic, drug, and soap industries. It would be used in the manufacture of fertilizers—a cheap and dependable product to insure the continued production of agriculture products. We know that the future will bring us many new plastic products. Some are now on the market; but after the war the plastic industry will really take its proper place in marketing its many and varied products. New sources of supply for the raw materials must be developed.

There is still one other use of hydrogen, possibly more important than the others mentioned. That is its use as a reducing agent in connection with the vast supply of iron ore in northern Minnesota. The Mesabi and Cuyuna Ranges supply a great share of the ore used in this country. By purifying the ore at the source it would save money now spent in transportation of waste material. By doing so boats, barges, and rail equipment could be released for more important uses elsewhere. This process would allow for the more complete

and more efficient use of the ore reserves.

Supply of Lignite is Ample

North Dakota lignite deposits are ample. There is an estimated 695,000,000,000 tons of lignite available in seams varying in thickness from 2 to 15 ft. The coal varies greatly as to moisture and sulphur content; these are the determining factors in the value of the lignite for use in this process. A high-sulphur coal cannot be used. The location, too, is important, as the raw coal must be near good transportation facilities.

The Dakota field is divided roughly into three sections. The Minot area serves all mines east and west of the city as well as truck mines to the south. The Bismarck area serves the mines west, northwest, and north. The Mobridge area serves mines west in both North Dakota and South Dakota.

It is proposed to establish char plants at Bismarck and Minot to serve these areas. The raw coal would be charred, then reshipped to a hydrogen-producing plant in the Twin City (Minneapolis-St. Paul) area, preferably located on the Mississippi River. By processing near the mines a substantial savings in freight would be made. Four great transcontinental railways cross North Dakota, supplying excellent transportation facilities in either peace or war time. Minneapolis and St. Paul are centrally lo-

cated; they have adequate rail and water transportation and highways from all directions. They are near the lignite fields, the great iron ranges, and the points to which the products will be shipped.

The lignite mines in North Dakota have a far greater capacity than is now used except for one or two weeks per year. Ninety-five percent of all coal mined is from the Bismarck-Minot areas. They can easily supply all coal necessary for a hydrogen-producing plant. It would not necessitate additional expenditures or additional equipment. Such a tonnage would stabilize the industry and the state. Coal is now mined, except in one or two places, by stripping operation. Ten to 15 ft. of solid coal is uncovered by removal of 25 to 45 ft. of clay and sand overburden. The seam is clean, free of partings and impurities. Small shovels of $\frac{3}{4}$ to 2 yds. capacity dig the coal. By continuous operation of the North Dakota mines it would be possible to triple the production without increasing the cost of the coal or the investment required in machinery and equipment.

The North Central States have been isolationist in sentiment, but the lignite industry realizes the seriousness of the national emergency. They have a potential source of needed materials and are ready and anxious to cooperate to the fullest to win the war. The nation is ours and ours is the nation's.

Manganese Ore Shipped

One thousand tons of high-grade manganese ore has been shipped by the Sunshine Mining Company's Lake Crescent mine on the Olympic peninsula in Washington to Port Angeles for stockpiling. This is the first shipment of the 10,000 tons of ore ordered by the Federal Metals Reserve Company under the strategic minerals act.

Canadian Magnesium Plant

The Canadian Department of Munitions and Supply has entered into an agreement with the Consolidated Mining and Smelting Company of Canada, Ltd., whereby the latter will construct and operate a Government-owned plant for production of 5,000 tons of magnesium per year. Location of the plant has not been finally determined, and will depend upon the availability of raw materials.

The Consolidated Mining and Smelting Company of Canada, Ltd., has offered to build and operate the plant

without fee or profit. This company has already built and is now operating plants at Trail, B. C., and at Calgary, Alta., under similar arrangements, and their relationship to date has been most satisfactory.

It is expected that the magnesium plant will be in production in about 10 months. It will be built for the account of the British Government, and the product will be allocated to that government.

Pennsylvania Iron Mines Reopened

Iron ore mining operations near Dillsburg, Pa., are to be revived early in 1942. Magnetic iron ore will be taken from the Logan mines in that area, which have not been worked since 1909. The ore will be used to supply a smelting furnace to be erected near Hershey, Pa., by the Pittsburgh Coal & Coke Company. When last operated the ore was consumed by the Central Iron & Steel Company, Harrisburg.

The Logan mines, owned by the Logan Estate, represented by Fred W., and James J. Logan, York, Pa.,

comprise deposits of magnetic and hematite ores. Only the magnetic ore will be worked.

The mines were cleared of water in 1917 by the Berkenbine Engineering Company, preparatory to resumption of operations, but the war at that time, coming to a close, ended the project.

Tungsten Mill Producing

The 150-ton capacity mill of the Tungsten Metals Corporation, located in the Shoshone district, south-east of Ely, Nev., was recently reported to be treating 100 tons per day of tailings in addition to ore from the company's property. The mine is opened by three haulage tunnels and development of new ground is proceeding.

Engineers of the U. S. Geological Survey recently completed 6,000 feet of diamond drilling on the property as part of the Federal strategic minerals program. This project is said to have revealed the existence of substantial quantities of scheelite of mill grade.

Utilizing MINE SCRAP By Welding



Fig. 1. Tower for high tension wires shows use of arc welded scrap pipe

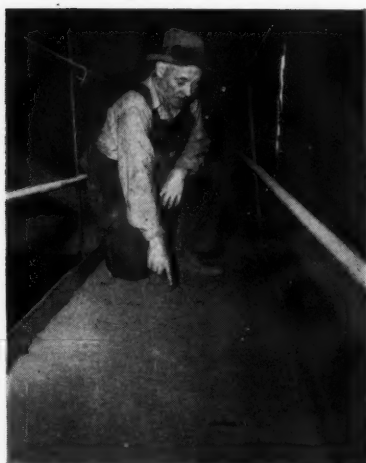


Fig. 2. Welding foreman inspects scrap iron walk over leaching tanks



Fig. 3. This section of iron walk is an example of the odds and ends which can be welded together to form a useful unit

THE difficult task of maintaining heavy equipment used in milling is made easier by the extensive use of electric arc welding at the largest cyanide custom mill in the world.

To speed maintenance and the construction of new equipment, the Golden Cycle Corp., Colorado Springs, Colo., has equipped their plant with seven arc welding machines. Three-phase power is supplied with outlets throughout the mill to facilitate attachment of a welder and the running of a relatively short welding cable to any job throughout the mill. Shielded arc equipment supplied by the Lincoln Electric Company, is used.

A great deal of scrap iron, such as old structures, pipe lines, tanks, etc., is available at the mill and many uses are found for this. An example is shown in Fig. 1 which illustrates a tower for high voltage lines. This was built largely from reclaimed pipe. The columns are 6-in. pipe, the cross members 4-in. pipe and the diagonals pipe 2 in. in diameter—all arc welded to form a clean-looking structure. The welding and machine shop building is in the background with tanks used for flame-cutting shown on the outside.

One of the problems in the vast gold recovery mill is the construction of suitable walks over the big leaching tanks to permit workmen to reach the various parts and mechanisms above the tanks. Welding foreman,

W. E. Warner, is shown in Fig. 2 kneeling on one of these walks, which the maintenance crew fabricated from bits of scrap salvaged from the sides of old tanks. The total length walk such as this is 700 ft.

In Fig. 3 Warner is examining a strip of walk made of odds and ends. Gaps and holes are left purposely to permit drainage from the walk. The walk is 30 in. wide and is built in 20-ft. sections. One man welding and another cutting can construct one of these sections in a day, according to Warner. He explains that whereas this might appear to be expensive, a number of welders are hired by the company for maintenance, and work on projects constructed from scrap materials keeps them busy between major jobs when they might otherwise be idle.

These walks are suspended by 1/2-in. round bars supported underneath by 2-in. by 2-in. angles. The whole walk is suspended from the trusses of the building.

Scrap iron also is used in the fabrication of foundations for some of the equipment of the mill. Fig. 4 shows a foundation for a classifier built of 12-in. I-beams with cross members of 6-in. channels and vertical columns of 6-in. pipe. There are 13 welded joints in the 29 in. length of this foundation and each splice is a straight butt weld made with 3/16-in. "Fleet-weld" electrode welded all around

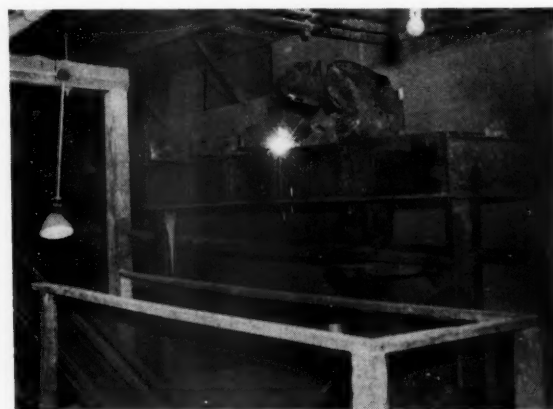


Fig. 4. Welder works on fabricated foundation for gold recovery apparatus

both sides of the flanges and the web with two passes.

There are 12 sand-leaching tanks in the cyanide leaching department of the company. These are 50 ft. in diameter and 15 ft. deep. A number of the tanks have been rebuilt recently. An example is shown in Fig. 5 which shows a tank of all arc welded construction built from scrap plate.

Figs. 6 and 7 show a roller feed for power shear and power punch work which was fabricated by the maintenance department of the Golden Cycle Corp. The roller is a 3-in. pipe with an axle of 3-in. round bar. This axle is supported in a structure made from 2½ in. by ¼ in. bar as shown in Fig. 7. The bottom of the roller frame is a flat bar 2½ in. by ¾ in. To this is welded a 1-in. diameter



Fig. 5. Arc welded leaching tank used for gold recovery



Fig. 6. See below



Fig. 8. Mixers used in gold recovery



Fig. 7, and Fig. 6 (above). Roller feed used in power shear and power punch work, made of scraps arc welded together.

screw which permits the roller to be raised and lowered when the nut is turned by means of ¾-in. bar handles. The supporting frame comprises a 4-in. channel at the top with

legs of 2-in. by 2-in. angles, braced by 2½-in. by ¾-in. flat bar. Most of this material was scrap but the pieces when arc welded together formed a solid, strong unit.

A battery of mixers is shown in Fig. 8. The tanks, motor brackets and all parts are arc welded and are typical of many of the process machines and structures throughout the mill.

California Copper Mine to Reopen

It was recently reported that pumps had been installed at the Keystone shaft of the property of Calaveras Copper Company at Copperopolis, California, preparatory to unwatering the northern workings.

Commercial ore is reported as being exposed above the water level and extensive prospecting of known veins and ground believed to contain virgin ledges is scheduled when dewatering is completed. Mining will be centered on the Keystone at first, to be followed by development of additional claims.

Noted producers of copper in the early years of California and during the World War, the Calaveras group

was closed down 20 years ago when the price of red metal dropped below the profit level. The Keystone shaft is 500 feet deep. Copperopolis, once a thriving community, has been little more than a ghost town for 10 years.

Higher Lead Prices Permitted

Alternate temporary choices on maximum prices of metallic lead products and various lead alloys were granted producers of metallic lead products in late January by Leon Henderson, Administrator, Office of Price Administration.

Modifying its previous position, OPA wired these producers permitting them either to hold to prices no higher

than their prices on January 2, 1942, or to charge no higher than their maximum April 1, 1941, price, plus .65-cent per pound of lead content in the particular product. The request applies to all shipments made on or subsequent to the date of receipt of the latest telegram.

If both alternatives result in excessive hardship, the Administrator stated, producers are permitted to use open billing. If open billing is used, written notification must be given OPA of producers' agreement to make final billings at levels not in excess of the maximum prices to be announced by Mr. Henderson's office.

These alternate choices are of a temporary nature until such time as studies have been completed and formal maximum prices set.

Problems in Present-Day HYDRAULICKING

The Battle of the Tailings virtually ended hydraulicking in the West 60 years ago. Recent construction, by the Government, of some debris dams has not resulted in a revival of the industry on the scale that was expected, and strong opposition still exists to any revival.

What further can be done to permit this one-time large scale industry to flourish and at the same time satisfy the objections of those who for various reasons oppose such resumption? Mr. Hutchins gives here a very thought-provoking analysis of these questions.



By JOHN POWER HUTCHINS

Consulting Engineer
San Francisco, Calif.

AS hydraulicking is now almost dead—an expansion, expected from the higher price for gold, has not materialized—I am concentrating attention here upon the problems that face the resuscitation and resumption of hydraulic mining, particularly as this includes the discussion of present-day problems which are generally the same.

In a short paper it is possible only to discuss briefly the numerous salient questions. My principal object, in addition, is to emphasize what seems to me to be the indispensable need for teamwork and cooperation in the future; so that there shall not be another struggle, like that of the Battle of the Tailings, that raged 60 years ago and resulted in the end of large-scale hydraulicking.

Hydraulicking was Formerly a Major Industry

The problems of hydraulicking may be said to be in proportion to the great magnitude and widespread effects observed when that kind of mining was at its zenith about 60 years ago. Then there was an aggregate capital investment of \$100,000,000 in about 500 mines, their equipment and water-supply systems. They produced about \$10,000,000 worth of gold per year. It was said that thousands of acres of valley lands had been affected by tailings from hydraulic mines.

Thus, the resumption of hydraulic mining, on a large scale in the Sierra Nevadas, is a big and complex problem and of numerous and minute ramifications.

It will affect areas as high as 8,000 ft. and as low, almost, as sea-level, over many square miles of varied territories, those of high mountains and those of the Central Valley. Miners, farmers, ranchers, irrigationists, town-dwellers, electric-power generating companies, sportsmen, tourists, river steamer operators and others, and even the California State and Federal Governments will be interested directly or indirectly. It may well be said, as observed in the past, that some groups will merely imagine they will be effected or damaged. However, this mistaken attitude may be that of many people, often in organized groups, stridently vocal and fiercely aggressive, and experienced in the arts of publicity and who know how to get what they want; so this becomes an extremely important consideration.

The approach toward an intelligent and effective solution must be on a scale commensurate with its magnitude and intricacies. It is also obvious that considerable time will be consumed to obtain agreement among the numerous interests, and it is therefore probable that any early resumption of extensive, large-scale hydraulicking is extremely unlikely. It is clear that, even were all the numerous somewhat conflicting interests somehow harmonized, to try to effect the resumption of hydraulicking on a large scale would require several years, even to develop an adequate supply of water. It is, in addition, certain that as long as the war continues, efforts will be more or less at a standstill.

Unfortunate for hydraulic miners is the circumstance that Uncle Sam does not seem to think he needs more gold, despite the opinion of intelligent, disinterested observers that the United States cannot have too much gold in the post-war period, thought by them to need or desire much gold. Thus producers of gold are already in difficulties. They do not have priorities. This situation seems certain to continue and probably get worse during the period of the war. These and other factors will delay large-scale resumption.

Hitler boasts that Germany carries on without having or needing gold and that the noble metal will have an ignoble role after he has won the war and established his new order. But it is worth noting what, apparently, is contradictory; the German invaders have shown a remarkable interest in the gold of the occupied countries. It is noteworthy, also, that if Germany wins the war—and thus gains South Africa and other gold-producing countries—she will then have a tremendous interest in what she now calls an ignoble metal.

I think that Germany is sure to be defeated eventually, though it is impossible to predict how much time will be needed. Probably it will require several years. Napoleon, a vastly more competent man, while also trying to

conquer Europe, carried on for about 20 years. Hitler will not be able to endure for so long a period. It seems a far cry from Hitler to hydraulicking, but one may predict confidently that among the list of his numerous crimes we may register a complaint that he will delay the resumption of hydraulicking. Partial admissible proof of hydraulic gravel deposits on the Yuba watershed being carried on by a powerful London group in 1939 was discontinued immediately after Hitler attacked Poland.

The Future Price of Gold Is a Factor

It may be no more than stimulating to discuss succinctly the future price of gold. However, I shall do so. Mr. Roosevelt has the authority to raise the price of gold further and he can do so by lowering the gold content of the dollar from 59 to 50 cents. There seems to be no present prospect of such action. However, when one tries to imagine or forecast his future action one is at sea. When one remembers the \$20,000,000,000 worth or more of gold buried in Kentucky, one must ponder and wonder if we shall be able, post-war, to resist the temptation to raise the price of that gold, and thus make such a "profit" as materially to reduce the colossal debt we shall have created in destroying the Nazis and others who attack democracy.

It is usual for governments to clip the coin after periods of financial stress. We are now in such a period, a period sure to become progressively worse. We saw our coin clipped after the last war, although not until about 15 years had passed, and we may be fairly confident that it will happen again after the present war and probably sooner than after 15 years and with a greater degree of clipping. Indeed, it may rather be slashing than clipping. My excuse for this apparently tangential and digressive discussion is to suggest that the resumption of hydraulicking may well be stimulated and aided by a higher—perhaps a much higher—price for gold.

Modern Machines and Equipment Will Reduce Costs

One of the problems of present-day and future hydraulicking as well, especially in view of a prospective greater mining cost per cubic yard,—due to storing tailings—this a charge as great or nearly as great as the costs claimed by some hydraulickers of the last century for total working costs,—is shaving operating costs as nearly as possible to the irreducible minimum. I believe

that the use of modern machines and materials may well make for important cost reduction. It is proper to say the present and future use of materials and apparatus, not used in early-day hydraulicking, will help to lower cost of operations, and to achieve a better recovery of gold. Among these materials are manganese steel and rubber. Manganese steel, developed so extensively for use on gold dredges, will be of great utility in hydraulicking where extreme durability is desirable and where gradients for sluices are flat. Smooth manganese riffles will be helpful to achieve high duty per miner's inch with such gradients. The recent development of so-called rubber "cocoa-matting" will be useful for gold saving on hydraulic mine undercurrents. It is certain that when hydraulicking shall be resumed on a large scale, our ingenious makers of machines and materials will design and construct novelties useful in lowering cost and saving gold.

In recent years there has been a striking development of machines, driven by electric motors, gasoline engines and diesel engines. Among them are excavators and earth-moving devices—the power shovels, draglines, bulldozers, carryalls, scarifiers, etc., such as are often seen building roads. These machines are now being used in many kinds of mining, including placer operations, either in principal or subsidiary functions. It is certain that the hydraulic mines of the future will use some or all of these machines—either as now built or specially designed—on an important and considerable scale. These machines and others that

will be developed and evolved to complement, supplement or modify the straight hydraulic mining process, may well have a profound effect to make the hydraulic mine of the future very different and much more cluttered or equipped with machines than were the diggings of the old-timers, where all that was used of metals were often only the pipes, valves, giants, tools, nails, a clean-up outfit, a blacksmith shop and headlights for night work. Such was the simplicity of requirements for early-day hydraulicking.

Deposits May be Dry-Stripped for Hydraulicking

Indeed, serious consideration is being devoted to the possibility of dry stripping considerable depths and gravels of very low tenor, the deeper and richer gravels to be worked by the hydraulic process. This instance—one of many—forecasts clearly that there will be great opportunities for the exercise of constructive engineering and imagination, both in the use and invention of machines. Such possible procedure may be said to be in active contemplation now, with the present exclusive idea, however, to lower costs for mining gravels and not particularly with the idea of economizing on the storage capacities of existing and projected tailings reservoirs. It is suggested here that steps should be taken by some authorities or associations to encourage the hydraulic miners thus to economize the use of storage reservoirs by charging less per cubic yard stored to such miners as strip and waste top fine gravels dry and mine only coarser



—PHOTO U. S. BUREAU OF MINES

Hydraulicking at the LaGrange mine, Trinity County, Calif., with a 9-in. giant

gravels. Stripping fine materials by dry excavators will effect a less rapid filling of tailing storage reservoirs. This is an important aspect of the tailings problem. It is worth remembering that when and if large new water-supply systems be installed, the use of modern machines, powered with gasoline and diesel engines, will have an important effect and so reduce unit costs for earthwork while also reducing the time needed for construction.

As an example of what experienced hydraulic mining engineers think of the possibility of using machines in conjunction with straight hydraulicking, the following set-up is suggested for a large gravel deposit. Hydraulic giants to excavate the gravel from the banks and wash it into a sluice—really a launder—with smooth manganese steel bottom and sides. At the end of the launder to have a grizzly to remove larger cobbles and to have a dewatering device, a trommel to disintegrate thoroughly tight gravel and remove larger material, undersize to pass over tables, like those of a gold dredge, perhaps also through jigs. Nearly all of the tailings then to be stacked by one or another kind of existing types of machines.

Tremendous Quantities of Gravel Have Been Mined

I shall now try to give some idea of the quantity of gravel that has been mined. The report of G. K. Gilbert, in 1914 (Professional Paper 105, U. S. Geological Survey), made after a study extending over three years and giving consideration to the sources, quantity and distribution of materials of natural erosion. These figures are really merely estimates and therefore only approximate. He estimated a total 1,325,000,000 cu. yds., mined between 1849 and 1909 in the basins of rivers tributary to the Sacramento River. He estimated that during the same period some 420,000,000 cu. yds. of debris was due to natural erosion. It was alleged that the Sacramento and Feather Rivers were considerably shoaled; that, at Marysville, situated at the confluence of the Yuba and Feather Rivers, the bed of the Yuba was raised about 15 ft. and at Sacramento, on the Sacramento River, about 7½ ft. (The relation between these two figures, one being twice the other, suggests guessing by someone.) One may properly suggest that silt from natural erosion was considerably more to blame—that is, in proportion to the respective volumes above—than the so-called hydraulic slickens, the

former being composed of finer particles and so more easily carried long distances.

With the termination of hydraulicking—of that high, wide and handsome era—the rivers, with their natural flow, have gradually scoured their channels, especially where aided by levees. It is said that the bed of the Sacramento is now near its original elevation and the controlling navigable depths, below the city of Sacramento, are about the same as they were before mining was begun. Further, the report states that material, still remaining in tributary channels, which is brought down gradually by floods, can no longer be considered a menace to the navigable streams. In fact, the debris-carrying capacity of the Sacramento River is now greater than the supply of debris: and in time the river will free itself of its burden of debris. The conditions of the past are, however, positive evidence of the lack of capacity of the Sacramento to care for unrestricted hydraulicking of a major nature. These data are those of competent unbiased engineers. It is worth noting, — and appreciatively, — that gold dredge operators cooperated in a fraternal manner to help improve conditions of the Yuba River channel.

Disposal of Tailings Largest and Most Acute Problem

The big problem of hydraulicking, at its zenith, was the disposal of the enormous volumes of tailing. Government reports state that an aggregate of well over one billion cu. yds. of gravels was hydraulicked prior to 1900. There were lurid articles, particularly in the popular newspapers of the valley towns, 60 years ago, much more rhetorical than factual, telling of even greater volumes of tailing, and expatiating upon their effects.

The coarser materials of boulders and cobbles often found places of permanent repose in the gulches near the mines; but a considerable volume of fine material passed into the streams and was transported in turn to the rivers, with particular rapidity during freshets. Fines, locally called "slickens," were carried into the larger tributaries of the Sacramento and San Joaquin Rivers and into the rivers themselves. A considerable number of interests was affected and there began what may be aptly called the Battle of the Tailings.

On one side were the hydraulic miners and those sympathetic to them,

either through sentiment or for practical business reasons. Pitted against them were farmers, ranchers and others. The Miners' Association and Anti-Debris Association were formed in the early seventies. This struggle, not always without bloodshed, tar and feathering, went on for well over 10 years until all hydraulicking on the watersheds of the Sacramento and San Joaquin Rivers was enjoined by the Sawyer decision of the U. S. Circuit Court in 1884, and finally died after illicit hydraulicking ended in the early nineties.

This illicit hydraulicking, — what would nowadays be called "bootleg" hydraulicking, — was carried on. Some mines, even those of large and reputable companies, were operated surreptitiously. Espionage was done by the spies of the Anti-Debris Association who, in turn, were spied upon by spies, employed by the Miners' Association. These latter spies warned the miners of the snooping of the anti-debris spies so that the miners would not be caught violating the injunction. Eventually this bootleg hydraulicking became too difficult and was stopped.

Attempts followed by the miners to have laws passed to permit resumption of hydraulicking behind restraining dams. Finally the Caminetti Act was passed by Congress in 1893. The administration of the law was entrusted to the California Debris Commission, with three engineers of the Engineer Corps of the U. S. Army in charge. These engineers generally tried to foster the resumption of hydraulicking under exacting but usually fair restrictions and conditions, aimed to prevent damage by tailings. Hydraulicking was permitted behind rock-filled, log-crib dams. These dams were built by individuals or individual companies. Usually each operating mine had its own tailings dam. It is thus easy to comprehend how comparatively small dams were built not far from the mines and, so, high up the courses of the streams, which thus allowed only rather unfavorable dam and storage sites. Although the materials of construction were not generally expensive, the cost per cubic yard of tailings stored was high. In addition, these dams were not permanent structures and were frequently destroyed by freshets. Hydraulicking was not resumed to an important degree. The individual hydraulic miners and companies did not each need, — nor could they afford, — the expensive, large, permanent dams



—PHOTO U. S. BUREAU OF MINES

Two 9-in. giants working gravel into headrace at LaGrange mine

lected as the most economical and best situated for the purpose. The investigations of the Commission of gold content of the gravels lead it to the belief that there are large volumes of pay gravel. The Commission estimates the cost of hydraulicking without allowance for charges for tailings storage, at about 10 cents per cu. yd.

This 20-year plan may be said to have preceded several of the much-touted plans evolved in Russia and Germany and of which we have read and heard so much. In rough outline the plan is to construct several large dams to create tailing

reservoirs at the most favorable sites and where tailing from the gravels of greatest aggregate volume and promising gold content will be stored. The cost for these dams is planned to be returned by the mines to the state and federal governments, at cost rates per cu. yd. bank measurement, and varying accordingly to the installation cost of the dams. This plan included as essential and indispensable a guarantee by substantial miners and mining companies that they would use the storage thus provided. These storage-charges were expected to be from about 3.11 to about 2.3 cents per cu. yd. Aggregate storage capacity of the planned dams is about 200,000,000 cu. yds. It is interesting to note that, above the Upper Narrows Dam, on the Yuba River, and dependent upon it for storage, are an estimated nearly 400,000,000 cu. yds.; but the net storage capacity at this dam is only about 118,000,000 cu. yds. This planned storage is only for about 20 years operations. Thereafter additional storage reservoirs are expected to be provided. Indeed it is estimated that the capacity for tailings storage, needed by one property only, will

be more than the total capacity of the Upper Narrows Dam.

Other tailings storage was provided. On the North Fork of the Yuba River, at Bullard's Bar, a concrete dam, 175 ft. high, was built in 1924 by the Yuba River Power Co., since acquired by the Pacific Gas & Electric Co. This dam was licensed by the Federal Power Commission for power purposes, and the storage of tailings behind it was authorized by the California Debris Commission to the extent of 40,000,000 cu. yds. Since 1932 any mine on the North Fork, above this dam, can secure storage space by payment of 2 cents per cu. yd. mined. Prior to 1932 the charge was 3 cents. Some 2,000,000 cu. yds. have been mined above the dam. There are now 11 mines licensed to use this storage reservoir, and the debris storage now contracted for amounts to over 6,000,000 cu. yds. There are additional minor storage reservoirs for tailings now in existence and being used. There are 2 hydraulic mines licensed above the Upper Narrows dam and 3 above the North Fork dam. These dams cost an aggregate of about \$5,000,000. So there is surely something wrong.

Why Have Not Storage Dams Been Used to Fullest Extent?

The result of building these large tailing reservoirs has not been brilliantly promising for the resumption of hydraulicking on a large scale. But few mines have been operated and there is no present prospect that many old or new mines will be operated. It is reported that the reasons are several and varied. The real reasons have not been comprehensively and accurately learned by competent investigation. It is said that potential hydraulickers are deterred by the fear that they may be enjoined by those who allege that the water passing over these tailing dams is too turbid for water users below the dams. It is of importance to ascertain why these magnificent tailing-storage reservoirs are not being generally used. This situation needs ample consideration, probably best got by cooperation of all who are interested in mining as well as those who fear turbidity of waters. It has been suggested that the gravels so far attacked may not be rich enough to yield profit after paying a considerable sum per cubic yard for tailing storage. One reason could be the lack of adequate supplies of water, at the mines. There may well be other and numerous reasons; one suggestion is that experienced hydraulic mining en-

Why Have Not Storage Dams Been Used to Fullest Extent?

that would need to be built, if the favorable sites for dams, found only in the lower reaches of the river, were to be utilized. No effective cooperative teamwork among miners happened. So hydraulicking in the Sierras continued to languish for decades, but not without a constant and ineffective attempt being made for resumption. Since the formation of the California Debris Commission under the Caminetti Act, in 1893, over 1,200 applications for licenses to hydraulic have been received and over 900 licenses granted. Only about 25,000,000 cu. yds. have been mined under these licenses. At present there are 40 licenses in force. Stimulated by the present gold price of \$35 per ounce, there has been more activity recently than in many years.

Present Conditions Permit Resumption of Hydraulicking in Some Areas

I shall now give a brief account of the present situation regarding the plan for debris storage, developed by the California Debris Commission, to permit the resumption of mining on "a substantial scale." It includes 4 tailings storage reservoirs at sites se-

gineers and workmen are now scarce.

It is not of present interest nor is there time to give details of the construction costs, etc., for these dams. What is interesting and extremely important is that, at last, over \$6,000,000 are to be spent to construct big tailing reservoirs. Finally it has been recognized that the resumption of hydraulicking on a large scale could only be done after big dams had been built on what may be called a "collectivized" arrangement. The success of getting these dams by this procedure is highly suggestive of the means for solving some of the other problems in a similar way.

Turbidity of Water After Settling is Also a Factor

A present problem of hydraulicking is that due to the alleged pollution of waters turbid even after they have supposedly been cleared of sediment by settlement in the pools above the dam. Pollution questions are particularly in the interest of the Fish and Game Commission. This organization was established in the early seventies particularly to prevent over-fishing, over-hunting and other abuses. Its functions, like those of so many bureaus, have been increased by legislation, some allege by assumption or usurpation. With the rapid growth of population along streams that drain mining regions, with more fishing, boating, swimming, etc., there are objections to turbid water, also objectionable for potable domestic supply. Nearly \$1,000,000 per year of income to the Fish and Game Commission comes from payment for fishing and hunting licenses. Thus it is clear that recreational business is big business.

It is interesting to note that, due to comparatively recent state laws against pollution, hydraulic mining cannot be done from June 30 to December 1 on the Klamath and other rivers in northern California, in that very region where hydraulicking was not enjoined by the Sawyer Decision, as it was considered that the tailings did no harm. This situation is excellent evidence of how conditions change and how recreation and the Fish and Game Commission have been effective. However, this restriction is not serious as practically no mines on these rivers have enough water to hydraulic on any considerable scale after June 30 until the heavy rains of later autumn or early winter come.

It is also the opinion of the Fish

and Game Commission that the deposit of silt from hydraulic mines on stream beds is detrimental to the propagation, feeding and migration of food and game fish. Fish ladders over 70 ft. high are considered by the Commission to be impracticable of operation at present.

These points are bothersome, or worse when they are causing additional problems in the production of gold. Questions of fish migration, fish food, fish spawning are complex when the possibility of being affected injuriously by silt deposition and there is not always agreement by aquatic biologists in Government services as to any damage or degree of damage being done. Fishermen and other recreationists are increasingly numerous and their opinions must be given adequate weight and consideration. As suggested elsewhere in this paper, as to cooperation and teamwork, here seems to be an excellent opportunity.

Turbidity Tests are Over-Exacting

It is worth telling how exacting and particular are standards set by some pollution officials; and the following is eloquent. I asked for a rough-and-ready test to determine permissible turbidity. I was told that water must be so clear that one could see a steel needle in good light at a depth of 30 in. in still water. I suggest that you try this test. It is likely that, if tried now, at this period of low-water, when no rain has fallen for months along the lower reaches of streams on which no hydraulic mining has ever been done, one would be no more able to see the needle than to find one in a haystack, if the test were made below any considerable number of farms or human habitations.

While many would-be hydraulickers seem to consider the possibility of troubles through alleged stream pollution to be rather serious and merely one more skirmish in the Battle of Tailings, there are others who are fearful that it is no rear-guard action and that the outlook is not at all favorable. Anti-pollutionists, many of them capricious and ill-informed, are numbered by the hundreds of thousands, if not millions. These numbers are significant and suggestive.

Large Volume of Water Needed

Large volumes of water will be required for large scale resumption. It has been estimated that the aggregate of water used per year in hydraulick-

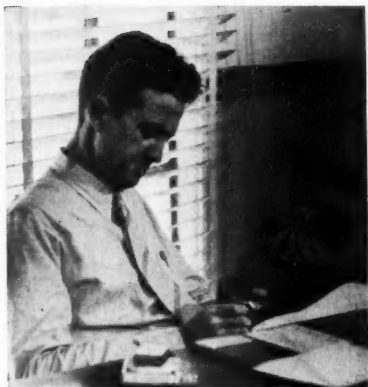
ing at the time of its zenith was about 600,000 acre ft. per year. No comprehensive investigation and study has been made to ascertain if such volume, or, indeed, if any other considerable lesser volume of water can be accumulated in new reservoirs at all or at reasonable cost or bought from the present owners of water rights once owned by hydraulickers. As most of the hydraulicking waters and their reservoirs and ditches have been diverted to other uses—in many instances to use for public utilities—it may be indispensable to construct new reservoirs and conduits on a large scale. However, it may well be found that some water may be bought from hydroelectric generating companies or from other owners of water rights for use for hydraulicking either before or after its use for other purposes. Perhaps a considerable volume in aggregate can thus be had. Water may be said to be the lifeblood of hydraulicking. With the enjoining of hydraulicking in 1884, rights to water, owned by hydraulickers, lapsed through non-use or abandonment or were sold for other uses. Reservoirs and the conduits for water, and diverting dams, headworks for ditches, flumes and tunnels were abandoned extensively and are now often of little value.

Some far-sighted hydraulickers say that the cart is being placed before the horse, as tailing dams will be unused if there be no water for hydraulicking. It is generally considered that the problem of tailings is in course of solution and that the provision of adequate water supplies may be the present main problem.

The problems of resumption are great and intricate. Strenuous efforts should be made to reestablish an industry that may again produce as lavishly as it did 60 years ago. Effort should be made to achieve general, active and keenly close cooperation. To do this, those who would revive hydraulic mining in California must give as much thought to their public relations program as is given to operational problems. Studies of water protection must be made and methods devised which will limit pollution to the absolute minimum; plans for policing the industry thoroughly and effectively must be perfected. This subject is no longer a poor cousin to be regarded as an annoyance—rather it is one of prime importance and should be a primary consideration along with the other mining preparations of this sort of operation.

AIR FREIGHTING

At Davao Gold Mines



By A. H. SHOEMAKER

Mining Engineer
Elizalde & Co., Inc.

IN mid-1935, Elizalde & Co., Inc., with head office in Manila, P. I., decided to do preliminary work on a gold prospect located in the Province of Davao, Island of Mindanao, Philippines.

The shortest trail from the coast was 35 kilometers over extremely rough, jungle-covered mountains. The only feasible route for a road required building 45 miles of highway, half of the distance being difficult mountain country.

The first work was done by hand, with supplies cargadored (carried) by local "non-Christian" tribes. By the time a cargador "ate his way out" from the mine to the coast, there was not a very large net load available for carrying on the work.

Small Field Was Constructed at Mine

A site for a small airport was located in a canyon about 4 kilometers from the mine and a field constructed in what may be termed "jungle" country. A Stinson Jr., and later a Waco, operated in and out of this small field. With these small ships it was possible to take in portable compressors and complete enough work to show that

Freighting by plane is becoming more commonplace as planes and engines are improved, particularly in out-of-the-way places of the world where the cost of developing surface transportation is excessive. Development of the Bulolo goldfields in New Guinea is an outstanding example.

The development of Davao Gold Mines property near Davao, on Mindanao Island, is another interesting example; and it is particularly interesting because Mr. Shoemaker here gives cost data on the operation. This article was written just before the Philippines were invaded; the present status of the property is uncertain, but Davao was one of the places where the Japanese made a landing, and the mine was therefore very probably affected.

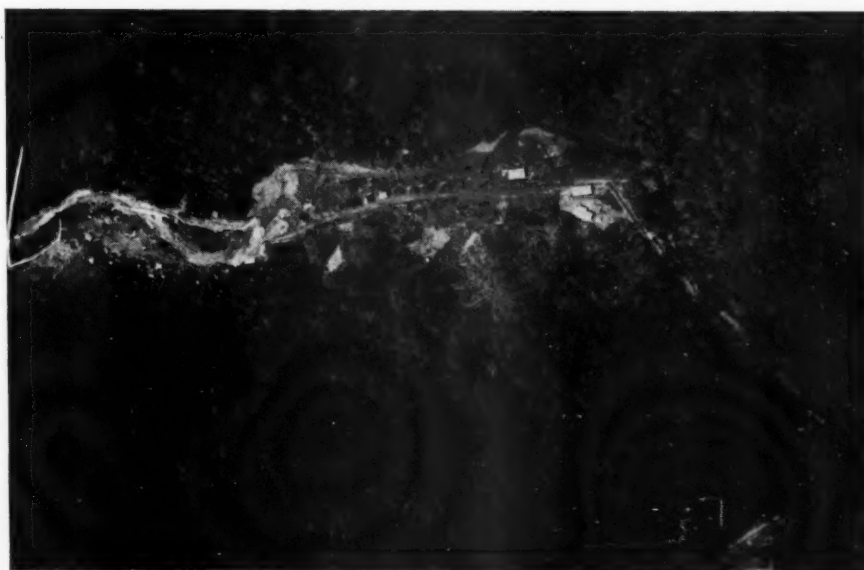
the prospect had important possibilities; but it was impossible, with such limited equipment, to complete enough work to prove the prospect a mine.

Landing Field Enlarged for Freighting Operations

It was found possible to enlarge the original landing field into a 3,200-ft. "one-way" field with an average plus

grade of 6 percent. The runway was 200 ft. wide. Since this was adequate for operating large ships, a search was started for a suitable cargo plane. The plane chosen was a Bellanca Aircruiser powered with a Pratt-Whitney SIEG Hornet. Changes over the current model were made, including a top hatch 45 in. x 96 in. to facilitate handling of large machinery parts, and landing flaps.

Main camp from the air



AVIATION DEPARTMENT

Cost Statement of Operations of Bellanca Aircraft Lic. NPC 41 From Oct. 1st, 1938 To Sept. 30th, 1940

	From October 1 to December 31, 1938			January 1 to September 30, 1940			Total, two years operations		
	Percent	Charges	Cost per lb.	Percent	Charges	Cost per lb.	Percent	Charges	Cost per lb.
OPERATING EXPENSES									
Direct charges:									
Aviation gasoline.....	12.56	\$3,958.87	\$0.0056	11.73	\$14,446.76	\$0.0050	12.02	\$9,019.00	\$0.0056
Oil and lubricants.....	0.41	129.50	0.0002	0.78	842.48	0.0004	0.83	622.64	0.0004
Materials and repairs.....	2.02	644.22	0.0009	4.00	5,796.17	0.0020	2.62	1,960.09	0.0012
Engine overhaul.....							3.40	2,546.56	0.0016
Total direct charges.....	14.99	\$4,732.59	\$0.0067	17.11	\$21,085.41	\$0.0073	18.87	\$14,148.29	\$0.0088
Indirect charges:									
Salaries—pilots.....	14.43	\$4,555.05	\$0.0064	13.72	\$16,902.43	\$0.0058	12.95	\$9,714.17	\$0.0060
Salaries—mechanics.....	10.23	3,229.01	0.0045	9.34	11,514.28	0.0040	8.70	6,522.78	0.0041
Repair and maint.—hangers.....	1.14	369.12	0.0005	1.30	1,607.89	0.0006	0.87	648.75	0.0004
Repair and maint.—fields.....	3.82	3,690.32	0.0044	3.37	4,888.94	0.0017	3.45	2,584.10	0.0016
Superintendence.....	3.71	1,711.47	0.0016	3.00	3,690.65	0.0012	0.07	50.00	0.0000
Insurance.....	2.39	754.00	0.0011	3.08	3,795.46	0.0013	2.25	1,690.56	0.0011
Depreciation—plane.....	27.00	8,524.47	0.0121	27.06	34,097.88	0.0118	32.21	24,152.67	0.0130
Depreciation—engines.....	5.50	1,735.62	0.0024	5.68	7,007.20	0.0024	5.34	4,004.33	0.0025
Miscellany.....	1.64	516.25	0.0008	2.93	3,606.20	0.0012	3.16	2,367.90	0.0014
Total indirect charges.....	75.86	\$23,945.31	\$0.0338	70.68	\$87,112.03	\$0.0300	69.00	\$51,735.84	\$0.0321
Total direct and indirect charges.....	90.85	\$28,677.90	\$0.0405	87.79	\$108,197.44	\$0.0373	88.23	\$65,884.13	\$0.0409
Add: Radio and transf. off.:									
Transfer office—Cattipan.....	5.64	\$1,782.12	\$0.0025	4.71	\$5,807.20	\$0.0020	3.38	\$2,531.80	\$0.0016
Transfer office—Maraut.....	1.82	572.64	0.0008	4.92	6,064.17	0.0021	4.35	3,264.64	0.0020
Radio cat.—Maraut.....	1.69	533.70	0.0008	2.07	2,554.79	0.0008	2.67	2,002.70	0.0012
Station-wagon expense.....				0.51	625.47	0.0001	1.73	1,297.55	0.0008
Radio and transfer office.....	9.15	\$2,888.46	\$0.0041	12.21	\$15,051.63	\$0.0050	12.13	\$9,096.69	\$0.0056
Total operation.....	100.00	\$31,566.36	\$0.0446	100.00	\$123,249.07	\$0.0423	100.00	\$74,980.82	\$0.0465
Costs:									
Direct cost, flying hour.....	121.30	Hours @ \$38.95	per hour	487.45	Hours @ \$43.23	per hour	290.45	Hours @ \$48.06	per hour
Direct cost, airp.-mi. (one-way).....	5,527.50	Miles @ 0.85	per mile	22,935.00	Miles @ 0.92	per mile	13,420.00	Miles @ 1.05	per mile
Direct cost, per ton.....	353.39	Tons @ 13.39	per ton	1,456.00	Tons @ 14.48	per ton	804.00	Tons @ 17.58	per ton
Direct cost, ton-mile.....	27.50	Miles @ 0.49	per t.-mi.	27.50	Miles @ 0.53	per t.-mi.	27.50	Miles @ 0.64	per t.-mi.
Direct cost, per trip.....	201.00	Trips @ 23.55	per trip	834.00	Trips @ 25.28	per trip	488.00	Trips @ 28.99	per trip
Indirect cost, flying hour.....	121.30	Hours @ \$197.08	per hour	487.45	Hours @ \$178.60	per hour	290.45	Hours @ \$177.94	per hour
Indirect cost, airp.-mi. (one-way).....	5,527.50	Miles @ 4.33	per mile	22,935.00	Miles @ 3.80	per mile	13,420.00	Miles @ 3.85	per mile
Indirect cost, per ton.....	353.39	Tons @ 67.76	per ton	1,456.00	Tons @ 59.83	per ton	804.00	Tons @ 64.30	per ton
Indirect cost, per ton-mile.....	27.50	Miles @ 2.46	per t.-mi.	27.50	Miles @ 2.17	per t.-mi.	27.50	Miles @ 2.34	per t.-mi.
Indirect cost, per trip.....	201.00	Trips @ 119.13	per trip	834.00	Trips @ 104.45	per trip	488.00	Trips @ 106.01	per trip
Total direct-indirect costs—flying hour.....	121.30	Hours @ \$236.03	per hour	487.45	Hours @ \$221.83	per hour	290.45	Hours @ \$220.60	per hour
Total direct-indirect costs—air.-mi.....	5,527.50	Miles @ \$5.18	per mile	22,935.00	Miles @ \$4.72	per mile	13,420.00	Miles @ \$4.90	per mile
Total direct-indirect costs—per ton.....	353.39	Tons @ \$81.15	per ton	1,456.00	Tons @ \$74.31	per ton	804.00	Tons @ \$81.88	per ton
Total direct-indirect costs—per ton-mile.....	27.50	Miles @ \$2.95	per t.-mi.	27.50	Miles @ \$2.70	per t.-mi.	27.50	Miles @ \$2.98	per t.-mi.
Total direct-indirect costs—per trip.....	201.00	Trips @ \$142.68	per trip	834.00	Trips @ \$129.73	per trip	488.00	Trips @ \$135.00	per trip
Add: Trans. off.—radio cost.....	201.00	Trips @ \$14.35	per trip	834.00	Trips @ \$18.05	per trip	488.00	Trips @ \$18.64	per trip
Total cost per trip.....	201.00	Trips @ \$157.03	per trip	834.00	Trips @ \$147.78	per trip	488.00	Trips @ \$153.64	per trip
Other data:									
Av. gas consumed per mile, 0.45 gal.....				5.364	Avia. gas consumed, gals.....		11.752	Avia. gas consumed, gals.....	
Pounds flown per gallon, 138 lbs.....				378	Avia. oil/lub. cons'd, qts.....		1,859	Avia. oil/lub. cons'd, qts.....	
Tons per trip, 1.7 tons.....				62	Flying days.....		122	Flying days.....	
Pounds per peso, —22.4 lb.....				2.2	Average trips per day.....		3.1	Average trips per day.....	
Upkeep per flying day, \$500.52.....				3,516	Average load per trip, lbs.....		3,298	Average load per trip, lbs.....	
Upkeep per norm. day, \$314.35.....				680,996	Total cargo (in) lbs.....		1,553,553	Total cargo (in) lbs.....	
				25,791	Pass. and luggage.....		56,000	Pass. and luggage.....	
					Total.....		1,609,553	Total.....	

NOTE: \$1.00=U. S. \$0.50.

The Bellanca company made a special study of our cargo problem, and furnished us with a series of loading diagrams indicating limits under special conditions. The maximum load under any particular condition was shown by load on the tail wheel. A regular truck load-o-meter was used, and the tail weight was recorded for each load as well as total cargo load. Because of this thorough load problem analysis, no difficulty was experienced in handling any of the equipment.

Hangars and shops were built at Davao City Airport. Shops were equipped with every facility for maintenance and repair except major overhaul of engines. A spare motor, propeller, landing gear, tail wheel and tail section were purchased with the plane. When due for overhaul the motor was pulled and shipped to the factory. Instruments included gyro-compass and artificial horizon, but no radio.

Flight Distance of 35 Miles was Accomplished in 15 Minutes

The flight distance was 35 miles, and contact between mine and Davao Airports was maintained constantly during flying hours by means of two CW radio stations.

This service was very severe on motor and landing gear. Flight from airport to airport took approximately 15 minutes. It required climbing from sea level at Davao to 3,200 ft. elevation four miles from the mine field and dropping to 1,600 ft. elevation in these final four miles. In spite of these conditions, full allowable time between major overhauls was obtained on engines, and landing gear stood up perfectly.

The included table of costs gives a quite detailed breakdown of the operation; it is doubtful whether these costs would be of particular value in estimating on another project, unless conditions were similar. Ton-mile costs

View of airport just before landing



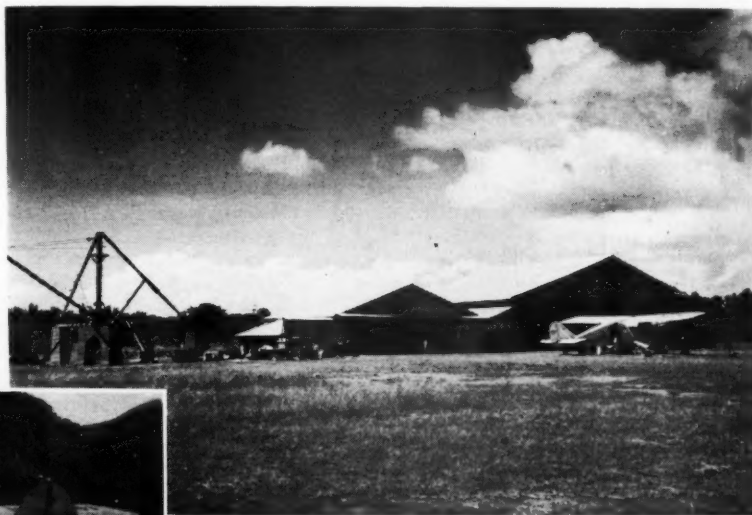
are based on half the actual mileage flown, as there was no pay load on the return trip from mine to Davao.

The depreciation period was set at three years. Subsequent sale of the plane and equipment lowers this cost, but it would be unsafe to increase the depreciation period for flying into a field such as we have at the mine.

The average flying time per day was 1.7 hours, an exceptionally low figure for normal freighting service. This short flying time resulted in higher

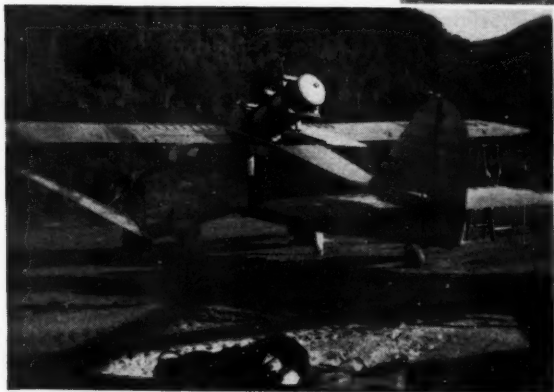
costs, but weather conditions at the mine prevented flying during late morning and early afternoon because of extremely rough air even on days that could be classed as perfect flying weather. Early morning fogs, obscuring the approach to the field, also caused considerable lost time.

The minimum shop facilities and mechanical crew which were felt necessary for proper maintenance were adequate for caring for more than the one large ship; therefore, on a larger



Above—Derrick, two hangars and Bellanca skycruiser

Left—Unloading an air receiver



operation, lower average costs could be expected.

Cost of airport construction at the mine and of hangars at Davao are not included in these figures. Hangars have been sold; and the cost of mine airport is considered a capital charge to be amortized over the life of the mine, as the field will be maintained as long

(Continued on page 57)

EXCESS PROFITS TAX Inequalities Between Competitors

IT is quite unnecessary to say that we who carry heavy responsibilities in the conduct of business recognize the need of heavy income taxes at this time. Above everything else, we know that the war must be won. And we know that however necessary borrowing may be, *taxation* is what a government must rely on in the long run to pay the cost of war. I say this at the outset so that, although I shall call attention to the need for a type of provision which would lessen tax liability of some businesses, it will be understood that I am not proposing any material lessening of the total tax burden. I assume, on the contrary, that taxes on corporate income are to be heavy; what I have to say is concerned only with the necessity of avoiding, as between competitors in the same type of business, similarly situated from a practical standpoint, dangerous inequalities in the tax burden.

Mr. Louis S. Cates, in some remarks made last fall at San Francisco, dealt with some phases of this problem. He called attention—and I want to do so again—to the necessity of including in the excess profits tax law a broadly phrased provision under which the Commissioner of Internal Revenue is given powers in a proper case to correct unconscionable hardships in particular instances arising under that law.

Mr. Cates pointed out that the United States has never yet administered a high-rate excess profits tax law, in which technical invested capital was an element, without giving the Commissioner such powers. The 1940 excess profits tax, when enacted, contained a broad provision, perhaps not appropriately worded and probably not safeguarding the taxpayer by making clear that it was to apply only to relieve hardships; the provision might have been interpreted to mean that the Commissioner might also determine that because of abnormalities the taxpayer should not be allowed the full credits which the law would otherwise allow. However, when the law was amended about a year ago, the Commissioner was deprived of any power to give relief from hardships

except in the particular cases which might fall within the specific terms of the amendment.

Possibility of Corrective Action

Since Mr. Cates' remarks were made some tendencies have been visible in the direction of correcting this situation, but no actual change in the law has yet occurred.

Beyond any doubt the question whether to give the Commissioner these broad powers or not will be before the Ways and Means Committee of the House and the Finance Committee of the Senate. In deciding whether to include such a provision in the law, the committee members will want to know whether or not there is substantial sentiment therefor. Although responsible groups, such as the Taxation Section of the American Bar Association, testifying at hearings, point out the importance of such a provision, the fate of the measure will largely depend on the number of independent expressions of opinion which come directly to Senators and Representatives—whether or not they are members of the Ways and Means Committee or of the Finance Committee.

I am glad to say that, to the best of my knowledge, the Senate Finance Committee, whose chairman, Senator George, said last August in the Senate hearings that he favored broad relief provisions, is still favorably disposed toward them. It remains true, however, that the drafting of revenue measures at present is one of the most difficult tasks ever approached by legislators, and the legislators will have to devote themselves to those provisions for which there seems to be an urgent demand. Furthermore, the new tax bill will of course be drafted at the outset by the Ways and Means Committee, whose views with reference to such a provision are as yet not fully formulated. Those of you who are interested in this matter should take immediate steps to express yourselves.

The fact is that it is hard to tell just now which companies will need such a provision and which will not. Under such a complicated law, there



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President
American Zinc, Lead & Smelting Co.

is room for many different constructions. The 1940 excess profits tax returns as prepared by competent accountants may indicate a tax liability which seems reasonable in the circumstances, but when the time comes for the Government to apply its own theories to these audits—perhaps a year from now—the result may be very different.

It is true that under the present law a taxpayer has two alternatives, that is, if the *invested capital credit method* produces an unconscionable tax, the taxpayer is not required to pay it if the computation in accordance with the *base period income credit method* produces a more reasonable result—and vice versa. It is too much to hope, however, that a company that is abnormal as to invested capital will surely be normal as to base period income; it seems likely, therefore, that there will be a large number of cases of excessive hardship as between competitors, notwithstanding the permissible choice of methods. A sick man may be equipped with remedies for two diseases, but they will not help him if his illness is due to some third disease.

It is also well to bear in mind that some products made a particularly poor showing in the base period years 1936 to 1939, inclusive; in practice, therefore, the taxpayer may know in advance that the invested capital credit is its only real reliance.

Tax Inequalities Between Competitors

The time being short, I will not try to illustrate the way in which the rigid provisions about invested capital may cause destructive tax inequalities between competitors. I do wish to mention, however, one reason why a tax law which seriously discriminates between businesses that are identical *except with respect to the history of their capital accounts* has a tendency to destroy the business on which the heavier burden falls.

It is certainly possible under the present law for two companies making the same amount of the same product with the same degree of efficiency and having the same present value of assets to differ widely as regards technical invested capital under the rigid provisions of the law. For instance, the plant of one may have been purchased years ago at low cost; the plant of the other may have been purchased recently at high cost. It is also true that under the existing law this difference may force the older company, with the lower invested capital, to pay a heavy excess profits tax, while the new company has to pay none. In such a situation, the one which pays no excess profits tax can use its surplus earnings to pay dividends or to accumulate a replacement fund. Assuming that the two companies had the same amount of money left after paying the corporation income tax and the corporation surtax, only a part of that amount will be left to the company with the older plant. That company is the one which will soonest need to rebuild, precisely *because* its plant is old, and when it does rebuild the labor and materials items will be

acquired at high prices. As compared with the newer competitor, which can declare dividends and accumulate surplus, it will be at a disadvantage as regards credit because neither its dividend record nor its balance sheet will be so good. Hindered both by a diminished credit and diminished available cash, as compared with its substantially identical competitor, the older business will be lucky if it can stay in the race at all.

I have said nothing at all as to the specific language to be employed in such a provision. I am told by those who have made drafts of such a provision that there are several possible forms it might take, any one of which would be vastly better, both for the interests of the Government and of the taxpayer, than is the existing law.

Can Assist Government and Taxpayer

Testimony before the Finance Committee last August brings out very clearly why the Government as well as the taxpayer will suffer unless the Commissioner is given the power—which he had under former laws—to deal promptly and justly with these cases in which the rigidly-expressed law produces outlandish results which cause serious discriminations as between competitors in the same business. When the letter of the law produces an outrageous result, such that the taxpayer must use all its resources to fight the tax or be forced out of business, the object of the tax law—to get money promptly into the Treasury—is defeated. Nothing but disadvantage can result from a tax law which produces a great mass of litigation instead of producing money. It is a commonplace truth that the success of

a government in collecting income taxes depends very largely on public opinion. Further, if a public impression is gradually built up to the fact that the tax law is unreasonable, unjust and incapable of being adjusted so as to fit particular cases, the Government's problems of making collections are immensely increased. That the Government, just as much as taxpayers, needs a law under which equitable results can be attained and cases promptly disposed of, is clearly shown in testimony before the Finance Committee. That testimony shows how the Government was able to use these "special assessment" provisions to its own advantage in making collections under the three First World War revenue acts, the 1917 law, the 1918 law and the 1921 law, all of which gave the Commissioner powers which he does not have under present law.

If you should take up this question with a Senator or Representative, and he should tell you that the possible abnormalities have been carefully foreseen in the present law, and that specific relief provisions have been inserted which do away with the necessity for any such general relief provision, I suggest that you get him to sit down with you and read over with you the so-called relief provisions he refers to. If he does that, he will see, as you will see, that they are so narrowed by express limitations, that they cover relatively few of the abnormalities which are sure to cause trouble if the law continues to be a law of hard-and-fast definitions which must be applied under all circumstances, and that they allow no relief at all based on unequal results as between competitors.

United States Treasury



POLLUTION—A Perennial Headache

The problems of pollution are perennial, and the responsibility for, and manner of, stream clarification cannot be settled at one fell swoop by drastic action of Federal and state officials, but calls for cooperation with private industrial interests and sportsmen to achieve a solution.

ONE of the most troublesome of industrial irritants is the question of stream pollution. Some five years ago I had occasion to discuss this subject at an American Mining Congress convention and after some research into the subject I found that no universal palliative for this particular headache appeared to exist; and very little progress appears to have been made since in settling the question.

With great regularity at each session of Congress two classes of bills are introduced—one advocating Federal cooperation with the states, scientific aid from the Federal Bureau of Health, financial aid to public corporations engaged in eliminating stream pollution, and a general attitude of cooperative helpfulness from the Federal Government toward correcting the evils which exist. The other class of bills are those which would superimpose a Federal bureaucratic regulation upon the state regulation of streams, backed up by prosecutions and injunctions in the Federal court for infractions.

The first type of legislative bills have usually been introduced by Senator Barkley, of Kentucky, in the Senate, and Congressmen Mansfield and Spence in the House of Representatives. The second type of bills have been urged by Senators Lonegran, of Connecticut, and Guffey, of Pennsylvania, in the Senate, and Congressman Mundt in the House of Representatives.

The representatives of the American Mining Congress have uniformly expressed their approval of the first type of bills and vigorously opposed the second type. Thus far nothing has been accomplished in the way of legislation from this quarter. The repre-

sentatives of industry advocating a constructive, helpful plan of Federal cooperation have been confronted by the organized sportsmen's societies, demanding drastic regulatory measures, enforced by Federal authority. The net result to date has been a stalemate. With the exigencies of war confronting industry, it seems probable that the stalemate will continue, rather than force a curtailment of mineral production in the alleged interests of protecting the fisherman and the bird hunter. But the contest persists and cries for equitable solution.

State Legislatures Have Attempted to Handle the Problem

A somewhat similar situation has existed in the various states. At almost every session of the state legislatures the same old conflict between industry and sportsmen, resort owners, sports writers and editors of sports magazines comes to the front. Bills are introduced, the legislators orate, but it is not often that anything constructive is accomplished. The Connecticut River still flows blue with copper sulphate, the Delaware River flows black with coal precipitates, the Missouri rolls its muddy way to the Mississippi and the Gulf, and some of the western streams are discolored by mine tailings. The sewage from municipalities, towns and hamlets pollute streams from the Atlantic to the Pacific. What is to be done about the situation?

As I have pointed out, there are those who believe that they can remedy the entire evil at one fell swoop by drastic Federal legislation. There are others who fatalistically shake their heads and say nothing can



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be done. The past history of other economic and social problems indicates to us that both of these antagonists are probably wrong.

Some Legislative Strictures Have Been Unreasonably Severe

The problem of stream pollution is as old as human history itself. There will always be mining and manufacturing wastes and sewage problems as long as there is a highly industrialized country whose industrial life begets these problems. They can and should be solved in time, but it will take much time and much money to do it. They will not be solved to the satisfaction of anybody by passing a law which says "Stop all wastes from your plant from ever going into solution into the country's streams." For example, Section 481 of the California Fish and Game Code says, in part:

"It is unlawful to deposit in, permit to pass into, or place where it can pass into the waters of this state any petroleum, acid, coal, or oil tar, lamp black, aniline, asphalt, bitumen, or residuary product of petroleum, or carbonaceous material, or substance, or any refuse, liquid or solid, from any refinery, gas house, tannery, distillery, chemical works, mill or factory of any kind, or any sawdust, shavings, slabs, edgings, or any factory refuse, or any lime, any cocculus indicus, or any slag, or any substance or material deleterious to fish, plant life, or bird life."

The expense of complying with such an arbitrary prohibition would bankrupt a greater part of the industries of the United States who have waste-disposal problems. The California Fish and Game Commission haven't gotten much in the way of results in enforcement of the foregoing code section because they can't prove to the satisfaction of the average jury that waste deposits have in fact been deleterious to fish, or if that can be proven, then they can't show who deposited the particular waste that was deleterious.

The Rule of Reason Should Apply

The rule of reason must be applied. The element of time as well as place must be considered. There are many periods of the year when mining and industrial wastes can be discharged into the streams and carried away into the sea on flood waters without substantial detriment to the country below or any injury to fish; there are other times of the year when the discharge of an equivalent amount of waste into low-water streams can cause great damage, harm, and inconvenience.

The place of waste disposal is important because waste or tailings may in some instances be disposed at such a distance from streams that erosive pollution will be minimized. Again, in some instances chemical treatment of mill or factory effluent may neutralize the detrimental features of the discharge. Still again, mechanical restraint may accomplish the desired result of preventing injurious pollution.

I may illustrate the foregoing points by reference to conditions with which I am familiar in California. Many, if not most, of our quartz mines are situated in relatively narrow canyons, with steep walls. The amount of level space upon which storage dams can be built is limited. The construction of concrete dams across such canyons is prohibitive in cost; and yet by building up dams of the tailings themselves, creating small ponds behind them, keeping the gates closed, and allowing the mill effluent to precipitate in quiet water during the summer months, a substantial amount of tailings from operations can be stored. When the winter months come and the streams are chocolate-colored with the natural erosion from hillsides, the gates may be opened, the tailings released into the stream, and by reason of quantity of water flowing at that period may be washed

away harmlessly to the sea. There is no detriment to either fish or plant life with this operation. It is simple, inexpensive, and practical.

Another instance may be cited of practices on the Klamath and Trinity Rivers, which drain into the Pacific Ocean. By agreement between the miners and the sportsmen, the legislature enacted a law (Section 482, Fish and Game Code) prohibiting mining on these streams between July 1 and November 30, unless tailings are prevented from passing into the streams or from affecting the clarity of water. This illustrates what I have in mind by the time principle.

Take again placer operations. Many of these operations in California are carried on by small operators of dragline or dredges. The construction of expensive tailings dams for such operations is out of the question. What these operators can do, and in most instances are doing, is to build small gravel dams between their washing plants and the streams, precipitate the material in suspension by the use of aluminum sulphate, or some other similar inexpensive precipitant, and allow the remaining water to escape into the streams. As these operations are constantly moving, they do not require a large tailings storage plant, such as the quartz mines need. The two California mining associations cooperated in securing enactment of a law at the last legislative session to make this procedure mandatory, and the results have thus far been beneficial in stopping willful pollution. This illustrates the use of chemical preventatives against stream pollution in mining. Undoubtedly, in other industries it is possible to use other methods of precipitation, and they are used.

Tailings Storage Dams are Effective in Some Localities

Still a third case in point is the mechanical prevention of waste by the construction of regular tailings storage dams. These have been undertaken by the United States Government on some of the California rivers in the last few years. The huge Narrows Dam on the Yuba is the most important example. These structures are adapted to the storage of hydraulic tailings, and designed to prevent injury to agricultural lands, as well as fish, below the dam in question. The Government engineers and the hydraulic miners of California hope, and have every reason to hope, that they will solve the old problem of

releasing the gold values locked up in the tertiary river channels without causing damage to streams and lands in the valleys, the source of so many early-day contests between miners and farmers in California. They are an example of what may be accomplished by mechanical means, and they are also a striking evidence of the tremendous cost of adequate protection against stream pollution on a large scale. The hydraulic mining industry by itself could never have financed the construction in the first instance, although the Government hopes and expects to recoup a substantial portion of the cost from the sale of tailings storage privileges.

The problems of the desert states are, of course, still different. They, for the most part, have no great rivers flowing to the sea. Their problems are close to the source of pollution. Land is cheaper and in general not so highly cultivated or industrialized as in the East or on the Pacific coast. Good fishing streams are not so frequent. The mining industry occupies a most vital position in these states and their local economies and is politically more powerful. The whole problem is more simple, from the miner's viewpoint, than it is in states with more diverse industries and great river systems.

What I have said indicates in a general way that there is no panacea for all pollution ills. Each problem must be attacked from the standpoint of what is possible and what is reasonable in the light of the operation and the results of the ensuing pollution. It is this angle which the law finds most difficult to cover. The tendency of legislators, administrative tribunals, and enforcement officers is to rely on precedents to create uniform remedies for all conditions. I submit that the problems of stream pollution, particularly in the mining industry, admit of no such solution. They must be met intelligently, and through cooperation rather than rigid regulation. In some instances the Government must help in financing the cost if the evil is to be remedied and industry is to survive.

Recalcitrant Operators Must be Curbed

Public enforcement officers must be given sufficient legal backing to stop the deliberately wasteful operator, the chiseler on industry, as it were. In the mining states, where interstate pollution problems are practically nonexistent, the state should perform this function. The sportsmen and their

fish are entitled to protection within reason, but that does not mean that they must expect clear water for fishing within a half mile of the discharge of every quartz mill or washing plant. Especially the subordinate Government employes, in the enforcement of the law, the district attorneys, the game wardens, the water commission employes,—all must be trained to apply this rule of reason rather than an arbitrary prohibition which will wreck highly beneficial industries, without a substantial improvement of the pollution situation.

Advocates of regulation of pollution by commissions say this can only be done by administrative rule—that prohibitory statutes must be specific in order to avoid claims that they are uncertain and therefore unconstitutional, and that they must be uniformly enforced. In answer to this, let it be first said that the experience of industry with Administrative application of law by Federal officials during the past seven years does not indicate the existence of flexible rulings to fit circumstances. One can instance the "portal to portal" ruling of the Wage and Hour Administrator, applicable to all mines, irrespective of local customs or working conditions, or one may cite the general futility of attempts to get the Treasury Department to grant exceptions from confiscatory tax burdens in cases where such exceptions should be made and are by law permissible.

Local Conditions Should Govern Regulation

I would rather leave it to a local court, jury, and district attorney to decide in stream pollution cases whether or not the defendant has reasonably complied with the law than to have some Federal bureaucrat in Washington promulgating general regulations to be applied with minute particularity to every stream in the country and to operations with which he is wholly unfamiliar. If there are serious interstate problems, why not try interstate compacts (as the oil industry did on production control)? Why must Congress enact a regulatory statute applicable to every state in the Union in order to remedy an evil on the Delaware and Connecticut Rivers? I submit that no justification has yet been shown for the proposed drastic Federal interference with intrastate stream pollution problems.

There must of course be education of the members of the industry. I cannot commend too highly the work which has been done by the Gold Producers of California, the industry association of the dredging and drag-line operators in this state. This association has maintained a stream pollution patrol since 1937. This work has consisted of regular visits by the association's engineer to all streams in the

Sacramento and San Joaquin Valleys on which mining operations are conducted, and, during certain months each year, to the Trinity and Klamath Rivers.

The purposes of the work are to educate mine operators—principally mechanical placer operators—in the best ways of carrying on their work with a minimum of pollution and also of meeting with sports and farm groups who have complained over water conditions due to mining. These latter visits have resulted in developing a better mutual understanding between the miners and the other two groups, and the results obtained from the patrol work have brought about a lessening of complaints.

The association has invited sportsmen and farmers to notify its office of complaints resulting from mining pollution, and when such complaints are received the pollution engineer is immediately dispatched to the source of trouble, where he has been highly successful in securing prompt cooperation from the operators involved when the cause was due to mining. In those cases where the miners were blamed for pollution not caused by them, its real source was ascertained and the complainants given the true picture.

The Gold Producers of California estimate that they have received the
(Continued on page 37)



Operations of the Dayton Dredging Co., Dayton, Nev.

1942 COAL CONVENTION To Be Minus Exhibits

THE War Production Board has requested cancellation of the 1942 Exposition of mining machinery, equipment and supplies at Cincinnati, as the letter on this page explains.

This came as a great surprise to the coal industry, which felt that the Exposition would be of direct aid to the war production program.

However, the judgment of the WPB is final. The American Mining Congress has unhesitatingly acceded to this request, and the exhibits at Music Hall have been cancelled.

The Annual Coal Convention, minus the exhibits will be shortened to a two-day meeting, April 27 and 28, with sessions at the Netherland Plaza Hotel. Subjects to be presented and discussed are shown on this page.

The chief aim and interest will be to determine how men and machines can put forth the greatest productive effort to supply the coal that is needed for the expanding program of military,

The following letter from the War Production Board, under date of March 11, tells the story—

"Supplementing our conversation of today, the War Production Board wishes to advise the American Mining Congress that the exhibits of machinery and equipment planned for Cincinnati the week of April 27 should be cancelled because of the needs of the existing national emergency.

"We regret the necessity for this action and sincerely appreciate your cooperative attitude in complying with the above."

aircraft and naval construction. Increasing the present coal tonnage and maintaining output at high levels introduces many problems of operation, management, personnel, maintenance and supplies, in addition to the difficulties occasioned by labor shortages and delays in obtaining equipment and material. The situation is perplexing and troublesome. However, trouble is an

old story in coal mining and the spirit of accomplishment was established long ago.

Accordingly, the Convention in Cincinnati will serve as an important industry "clinic" for coal operators and manufacturers, focused on what the industry and the men who compose it can and must do in the war effort.

Program Subjects

COAL PRODUCTION AND DISTRIBUTION

T. J. THOMAS, Associate Director for Bituminous Coal,
Office of Solid Fuels Coordination

FACE OPERATIONS—Cutting, Drilling, Blasting

Representative, Chicago, Wilmington & Franklin Coal Co.

WARTIME PERSONNEL PROBLEMS

W. B. GEISE, Mining Engr., Susquehanna Collieries Co.

SALVAGE OF SCRAP METALS

GEORGE T. WEYMOUTH, Chief, Industrial Salvage Section,
War Production Board

MAINTENANCE OF EQUIPMENT and Substitute Materials

EDGAR SCHWEITZER, Lehigh Valley Coal Co.

COAL DUST ALLAYING in Cutting, Loading and Transporting

J. C. Johnston, Preparation Mgr., Koppers Coal Div.,
Eastern Gas & Fuel Associates

WARTIME COAL PREPARATION—Maintaining Quality Standards

W. D. STEELE, Preparation Mgr., Consolidation Coal Co.

COAL DRYING and Other Auxiliaries of Preparation

JAMES HYSLOP, Gen. Mgr., Hanna Coal Co.

EXPLOSIVES—Handling and Distributing Underground

B. L. LUBELSKY, Engineering Mgr., Powhatan Mining Co.

MINE VENTILATION AND SEALING ABANDONED AREAS

WALTER BUSS, Mining Engr., Knox Consolidated Coal Corp.

DUCKBILL MECHANICAL LOADING

PAUL R. WICKLIFFE, Pres., Greenville Coal Co.

GATHERING BELTS AND MULTIPLE CONVEYOR UNITS

E. H. JENKS, Chief Engr., Rochester & Pittsburgh Coal Co.

TRACK-MOUNTED LOADING MACHINES

AUGUST J. BREITENSTEIN, Assistant Mining Engr., H. C. Frick
Coke Co.

SHUTTLE CAR OPERATION WITH TRACTOR LOADERS

Representative, Peabody Coal Co.

PREVENTION OF ESPIONAGE AND SABOTAGE

E. P. COFFEY, Chief of Technical Laboratory,
Federal Bureau of Investigation

PRIORITIES ON MINING EQUIPMENT

WILBUR A. NELSON, Administrator of Mining Branch,
War Production Board

SPECIAL COAL STRIPPING SESSIONS

PRIMARY AND TANDEM DRAGLINE OPERATIONS

LAKE STEWART, Chief Engr., Maumee Collieries Co.

POWER DISTRIBUTION AND PROTECTIVE DEVICES

RUSSELL ALPINE, Chief Elec., The Enos Coal Mining Co.

DRIFT MINING FROM STRIP PITS

J. M. MCCOY, Truax-Traer Coal Co.

SHOVEL TOOTH DESIGN AND MAINTENANCE

O. E. MAY, Chief Engr., Northern Illinois
Coal Corp.

STRIP MINE HAULAGE

A. D. HENRY, Assistant Supt., The Jefferson Co.

Open Discussion from the Floor Following Each Paper

With the COAL DIVISION

of the AMERICAN MINING CONGRESS

ROOF BREAKS IN PILLAR MINING

THE roof action in a coal mine has a definite effect on the design of the mining plan and a decided influence on the efficiency of the underground operations. This statement may not altogether apply to entry and room development, because effective supports can be used in the narrow work; however, in pillar recovery, the character of the seam, the immediate top, and the upper measures determine the plan and method of operation, and, to some extent, the equipment. In complete or nearly complete coal extraction, it is necessary to learn how the roof and overlying strata will or will not act and to be governed accordingly; theories of physics or mathematical calculations cannot be applied with assurance of accuracy to any particular mine and the only real proof for a method of pillar recovery is by actual trial.

Purpose of the Report

The committee report on roof action in pillar mining will not attempt to formulate any theory or formula, but rather will endeavor to establish connection between cause and effect. It may be possible, by examination of the results in a number of mines, to say that under given conditions a specific method of extraction would have expected results; if this can be done within reasonable limits of certainty, the committee will have performed a very useful service for the mining industry. As a corollary, if the committee reports serve to stimulate roof studies by mining companies, we are justified in believing that considerable knowledge will be added to our present ideas on roof action.

In planning this procedure, the subcommittee has decided to begin with an investigation of the roof action in concentrated mining with conveyors and mechanical loaders. There are two reasons for this decision, (1) in

● *A Preliminary Report to the Committee on Roof Action* By A. E. Long, Subcommittee Chairman

The Committee on Roof Action is making studies on various phases of their subject; a report on entry support materials, recently completed, has been published in the Mining Congress Journal and an investigation on methods to prevent roof rock deterioration is now under way. These reports refer principally to entries and rooms in development or first mining but a study on Roof Action in Pillar Extraction is also being conducted by a subcommittee under the chairmanship of A. E. Long, mechanization engineer of the Clearfield Bituminous Coal Corporation.

mechanized mining, because of its recent adoption, data can be secured which is not available in the older established systems; (2) in concentrated workings the smaller extent of the mined areas offer opportunity for closer observation than would be possible over large areas and long pillar lines.

The roof action in four mines are shown in Figs. 1 to 4 which are submitted here; Fig. 3 is an operation with mobile mechanical loading, while the others use conveyors. All of these mines have the similarity of working small concentrated areas and the sketches show how the roof falls occur.

Single Room Unit

Fig. 1 is a single room operation recovering the room pillars by open end mining; this method has been in use for several years and the following reasons are advanced in explanation of the favorable roof action:

a. The single room unit has only a small area working, and this small open space is located between the gob and solid coal. With regular falls occurring during the mining, there is no accumulated weight from a wide area of overburden.

b. The average cover is fairly light—about 200 ft., as shown in the borehole section; the surface country is hilly but not mountainous.

c. The borehole section also shows that, immediately above the coal, there is a 24-ft. strata of sandy shale; this shale, as experience has indicated, is usually capable of spanning an open area 75 ft. wide by 125 ft. long, but will break at about that limit. Between the shale and the surface there appears to be no strata strong enough to support a wider space, consequently, after the initial break, the upper measures subsequently cave or subside, thus relieving the coal from the weight of the overburden.

Double Room Unit

Fig. 2 has two conveyor units, with one room advancing while the previous room pillar is being drawn back. This, in effect, is nearly similar to Fig. 1 in having a small mined area between the gob and solid coal. The report does not state whether open-end pillar recovery has been attempted but, if so, it can be assumed that it did not prove as satisfactory as the cross-cut method now used. Roof falls occur at shorter intervals than in

FIGURE 1

A single conveyor is operated in rooms 40 ft. wide with 35-ft. pillars. The pillars are mined open end; the rate of extraction is rapid and the coal recovery is nearly complete, only small stumps, next to the gob area, are left unmined. The timbering consists of 5-in. round posts on 4-ft. centers; these are not removed and a breaker line of posts on 2-ft. centers is set when a fall is imminent.

The first roof cave usually does not occur until the pillar has been brought back about 125 ft.; the top breaks on the posts, leaving the face open, and the remainder of the pillar is mined before another fall occurs. There is no heaving or squeezing during the advance or retreat and the top gives two or three hours' warning before caving. Vertical slips or cleavage planes in the overlying strata have had no observed effect on the roof action.

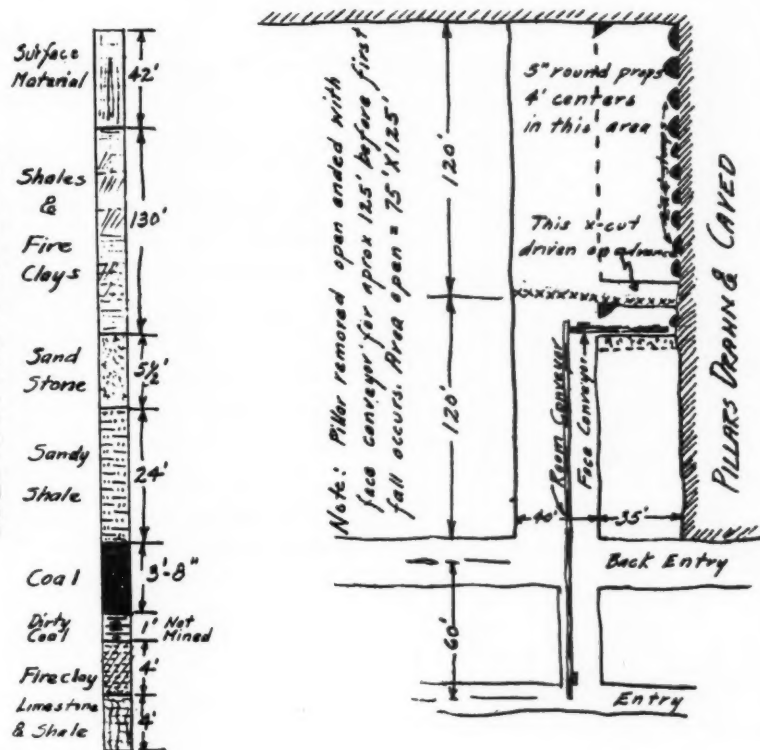


Fig. 1, but the top apparently is too strong to break on timber and the small stumps of coal left at the corner of the cross cut serves to protect the working place and acts as a roof breaker when the fall occurs.

Machine Pillar Mining

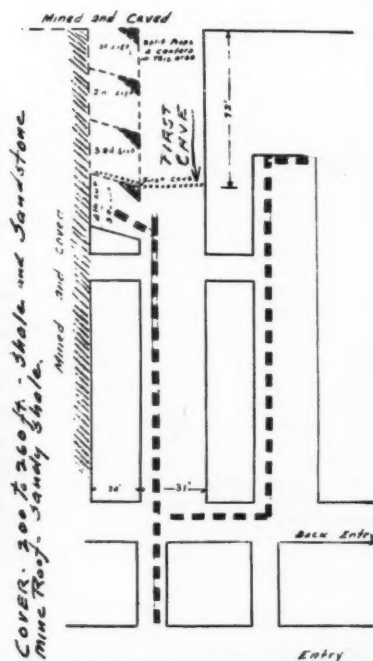
Fig. 3 is operated with mobile mechanical loaders and the pillars are drawn back with the loading machines. The plan indicates that at least two room pillars retreat simultaneously at stepped intervals, so there is a somewhat larger open space in this plan than in Figs. 1 and 2; however, the mined area is comparatively small.

The pillar is recovered by cross cuts, but the method differs somewhat from Fig. 2 in that a thin curtain of solid coal is left next to the gob. This, of course, serves as protection during the mining and also as a roof breaker when the falls occur. The roof apparently gives little trouble during the retreat; as the report shows, the top ranges from slate to sandstone, which affects the intervals at which the falls occur, but the roof action is reported as fairly regular.

FIGURE 2

Two conveyors are operated in rooms 31 ft. wide with 24-ft. pillars. The pillars are mined by cross cuts; small coal stumps are left at the inbye corners, but the extraction is nearly complete. The timbering consists of split props set on 4-ft. centers which are not recovered or removed to cause a roof fall.

The first roof cave generally occurs when the pillar has completed the third cross cut, leaving an open area 55 ft. by 72 ft., and the top then usually stands until the remaining pillar is brought back 130 ft. The initial roof break is in a sandy shale immediately over the coal and extends upward for 15 to 30 ft.; the sequence of further caves in the overlying measures is not known and does not affect the mining. Vertical cleavage planes, if existing in the rock strata, have had no observed effect on the roof action.



Pillars Prevent Roof Caves

Fig. 4 is a multiple conveyor system and the roof procedure here is quite different than in the other three examples. Hard sandstone lies a few feet above the coal and, as this is very difficult to break, no caving is attempted. Sufficient coal is left in the room and chain pillars to support the overlying strata and an area 1,200 by 1,500 ft. has been mined by this system.

The percentage of coal extraction is less than the mines in the other figures but under a roof of this type the cost of complete recovery with a caving system is apt to be so expensive as to be prohibitive. An exceptionally strong rock requires a large open area before caving; severe roof weight may cause serious interruptions or delays to the mining operation for some period before the fall occurs and the cost of timbering supplies and labor is high.

Whether or not this situation exists in the mine shown in Fig. 4 is not clearly indicated in the submitted report, but, if so, then the expenses of recovering these supporting pillars would probably exceed the value of the coal which is left unmined.

FIGURE 3

Mobile mechanical loaders are operated in rooms driven 24 ft. wide with a 36-ft. pillar. This is recovered by 24-ft. cross cuts, leaving a thin curtain of solid coal next to the mined area. The timbering consists of split props on 4-ft. centers and a line of breaker posts is set across the room at the inbye side of the cross cut.

The top is variable and may be either slate or sandstone. Under slate roof, the first fall occurs when the room pillar has been pulled back 30 ft.; under sandstone, however, the top will stand until the pillar has withdrawn 90 ft. and in both cases, subsequent falls occur at these same intervals as the retreat continues. These breaks are in the strata immediately over the coal, but the upper measures are irregular and possibly lenticular and the further action of caving or subsiding is not known.

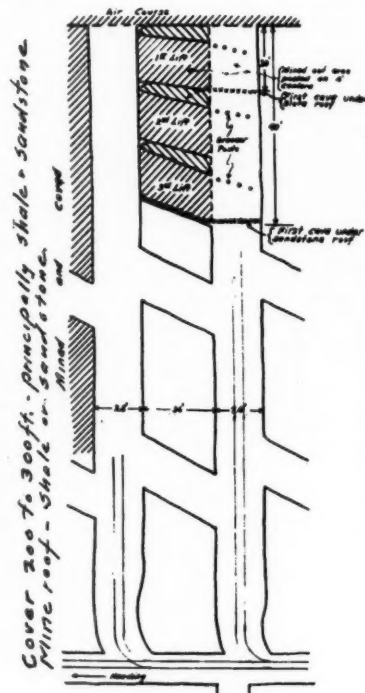
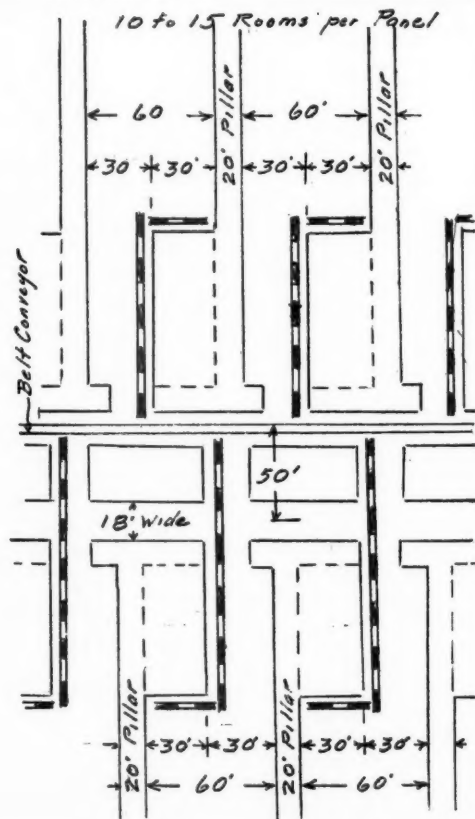
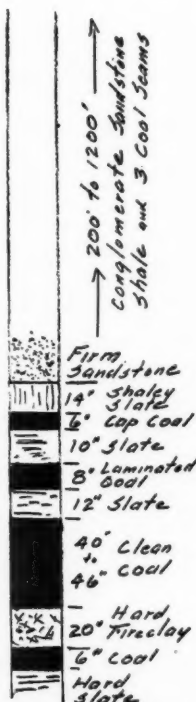


FIGURE 4

A multiple unit system operates from four to six room conveyors loading on a gathering belt. The rooms are driven 30 ft. wide and vary in length from 180 to 220 ft. After reaching their limit an additional 30 ft. lift is brought back retreating, making an open area 60 ft. wide. A 20-ft. pillar between each room and the chain pillars are left unmined.

Split posts of 6 in. diameter are set on 4½-ft. centers; these serve to hold the few feet of alternating slate and coal strata immediately over the seam. Above this, there is a thick, firm sandstone which is difficult to break or subside and appears to be sufficiently strong to span the 60-ft. room opening. The procedure, therefore, at this operation is not to attempt to use the roof caving system, but to leave sufficient coal in the room and chain pillars to support the overburden.



Investigating Sodium Vapour Lamps for Mines

The possibility of increasing underground illumination on haulways and manways in coal mines, and providing better all around lighting facilities, has been considered by the General Research Committee of the Monmouthshire and South Wales Coal Owners' Association, in investigating the possibility of the use of sodium vapour lamps underground. As reported in the Iron and Coal Trades Review of Great Britain, the committee states after investigation, that sodium vapour lamps underground showed certain advantages. With these lamps the minimum light in the test area was no where lower than with the ordinary tungsten filament lamps, and the amount of light per watt was $2\frac{1}{4}$ times greater. The committee found, however, that the greatest advantage was in the reduction of glare, which resulted in miners' eyes being better accustomed to the dark by the time they had passed under these lamps. Miners who were subjected to the test expressed themselves as being very favorable to the sodium lighting system.

For general use, the lamps were found to have several disadvantages, one of which was that the light emitted made it difficult to distinguish dirt from coal. It was concluded that sodium vapour lamps should not be used at the face, at picking belts, or in preparation plants where coal is cleaned by visual inspection. On the other hand, the 45-watt size of sodium vapour lamp gave as much light as the 200-watt tungsten lamp.

■ Pollution

(Continued from page 32)

cooperation of over 95 percent of the operators thus contacted; indeed, in many cases operators have voluntarily shut down at the request of the association until they could rectify their situations.

Complaints—Just and Otherwise

Since 1937 the office of the Gold Producers has received 136 complaints, all of which were turned over to the patrol engineer for "trouble shooting." Of these 42 were bona fide complaints, arising from such causes as carelessness, operational accidents or problems new to the operator where remedial practices were recommended and put in operation. The balance of complaints—those not founded on miners' responsibilities—were the results of freshets, pollution caused by others who were not mining, or just complaints from chronic kickers.

The Gold Producers of California have expended in excess of \$25,000 on

— New Chairman of Coal Division Elected —

The American Mining Congress is gratified to announce that Harry M. Moses, President of the H. C. Frick Coke Company, has accepted appointment as Chairman of its Coal Division. An operating executive, with wide experience in several states, Mr. Moses is thoroughly conversant with all phases of coal production. Under his direction the Division activities will be continued and expanded so as to render fullest services to the industry in the development of improved mining methods.



Mr. Moses succeeds R. L. Ireland, Jr., President, Hanna Coal Company, to whom the coal industry is deeply indebted for his assistance in organizing and effecting plans for the committee work.

this work over the period mentioned, and consider the money well spent in view of the results obtained.

Together with the California Metal and Mineral Producers Association, the local hard rock miners' organization, the Gold Producers have cooperated in the introduction and passage of bills in the California Legislature, especially designed to protect streams against selfish or unreasonable acts of recalcitrant placer operators. There are always a few chisellers who must be curbed. On the other hand, these associations have opposed, and thus far successfully combated, the arbitrary imposition on all of the mining industry of such stringent statutory regulations as would render it impossible of operation. This is a type of constructive accomplishment which I believe the mining industry in all the Western states should seek to initiate. We may look to the Federal Government for financial aid, for scientific suggestions, for comprehensive reports on experimental treatment of waste, and support those legislators in the Senate and House of Representatives who are trying to bring about cooperation of that sort. We might point out to the other class of legislators—those who would impose arbitrary Federal regulation on all industry in the country—the utter futility of such a scheme of things. We may demonstrate that the problems of

the West are not the problems of the East, and vice versa; that a palliative, if there is one, for the troubled waters of the Connecticut River would be of little avail in clarifying the waters of the Sacramento River. If we can do this, if we can convince some of our sportsmen friends that the most important thing for the interest of the sportsmen is not a fighting editorial against all pollution, which would black out Western industries, but rather a rational plan of prevention of truly harmful pollution adapted to the locality where it occurs, then we may hope to accomplish something constructive.

To sum up, then, my suggestion is that The American Mining Congress, as representative of the mining industry, continue its opposition to drastic Federal regulation; that the various state organizations carefully study local legislation relating to stream pollution, and endeavor to guide it along reasonable and intelligent lines; and that these state associations each assume the burden of seeing that mine operators within their respective jurisdictions take reasonable steps to eliminate harmful stream pollution as a result of their operations. If this be done, the industry can face the sportsmen with clean hands and justify its position on this vital subject to legislators and administrators alike.



WHEELS of Government

AS the war clouds roll ever more ominously, tempers are shortening among the sober-visaged men who are carrying the enormous load of responsibility in the various war agencies. Orders are flying thick and fast, curtailing and in many cases completely shutting off the use of the needed materials in civilian pursuits. Steel plates, rubber and many more of the strategic and now critical materials are becoming increasingly difficult to secure. This is true even for mining operations, although fortunately the staffs of the War Production Board and of the Army and Navy contain enough men with mining experience or with sufficient industrial background to realize that in the mines of the United States and of the western hemisphere lies the basic key to wartime production.

On Capitol Hill many members of Congress are pressing for suspension of the statutory labor provisions which are fettering industry. The strength of this feeling was evidenced on February 26 by an overwhelming vote approving consideration of Representative Howard W. Smith's amendment to the Second War Powers Bill, to suspend maximum hour and overtime provisions for the "duration." An increasing number of members are charging that "we cannot win the war with a 40-hour week." Subsequently, however, administration forces rallied to defeat the Smith amendment when presented. On the closed-shop issue, which threatens to bog down the War Labor Board, no less a person than Dr. Leiserson, of the National Labor Relations Board, has recently stated publicly that the nation needs legislation to determine a definite public policy.

So seriously regarded is the present threat to our national existence that at the annual meeting of the American Mining Congress, held in Cleveland, Ohio, early in February, the usually carefully detailed Declaration of Policy was cut by the resolutions committee to a short but earnest pledge (appearing elsewhere in this issue) of complete support to the Government until victory is won.

● As Viewed by A. W. Dickinson of the American Mining Congress

Washington Highlights

WAR: Washington pace quickens on war production.

HOURS: Many Congressmen would suspend maximum hour and overtime provisions.

VICTORY: American Mining Congress Annual Meeting declares all-out for winning the war.

TAXES: Revenue Bill hearings opened by House Committee on Ways and Means.

TUNGSTEN: Western Senators and Representatives in Congress protest Peruvian Trade Agreement.

TARIFFS: Negotiations under way for removal of Canadian-United States-Latin American duties.

SILVER: Morgenthau's attitude causes Congressmen to emphasize relation to base metal production.

WPB: Production of needed metals greatly stimulated by War Production Board.

PRIORITIES: Wilbur A. Nelson, Administrator of Mining Branch, WPB, makes great advances in supplying mine equipment.

COAL: Solid Fuels Coordinator lifts inventory restrictions; heavy stockpile program on.

EXPLOSIVES: Army insists upon immediate issuance of drastic regulations.

Copies of the Declaration and Pledge furnished to high federal officials have resulted in expressions of appreciation from the White House, the chief of the War Production Board, the State, War and Navy Departments, the Reconstruction Finance Corporation, the Office of Solid Fuels Coordination, and the heads of various sections of the War Production Board and the Office of Price Administration.

Tax Hearings Set

After several months of negotiation between Treasury representatives and staff officials of the Congressional Joint Tax Committee, announcement has been made of open hearings before the House Committee on Ways and Means beginning March 3. It is understood that Secretary Morgenthau and Treasury Tax Specialist Randolph Paul will make the first appearances, following which the hearings will re-

cess until March 9 while the public and members of Congress are thus given an opportunity to study the Treasury's recommendations.

While Mr. Morgenthau has made it known that over 60 items have been discussed with the Congressional Committee staff, it is believed that in many cases those conferring are still far from agreement. The Treasury is understood to have drawn up plans for a three billion dollar increase in corporation taxes, one and one-half to two billion dollars increase in individual income taxes, and two billion dollars from excise levies and the so-called plugging of loopholes. With the election due in November, many members of Congress are extremely "shy" of a sales tax and also of a withholding or "check-off" tax. Finance Committee Chairman George has been quoted as saying that a sales tax, as well as a broadening of the income tax base or a withholding levy, will be

necessary to successfully produce the seven billion dollars in additional revenue requested by the Administration. The average earnings credit basis for excess profits tax is still very much at issue between the Treasury and the Congress, and the Treasury threats against the depletion deduction, while not current in the past two weeks, may become an extremely serious factor in connection with the production of minerals for war needs.

Peru and Tungsten

In early February came hearings before the Committee for Reciprocity Information on the proposed foreign trade agreement with Peru under which tungsten ore and concentrates were listed for a possible reduction in duty by as much as 50 percent. Also listed for possible reduction was the present 7½ per cent ad valorem duty on bismuth.

Protesting for American producers against any reduction in the duty on tungsten was J. C. Trimble, representing the American Tungsten Association. From the Capitol, Senators Abe Murdock of Utah, Edwin C. Johnson of Colorado, Berkeley L. Bunker of Nevada, Ernest W. McFarland of Arizona, Carl Hayden of Arizona, and E. D. Millikin of Colorado, told the committee that the oft-recurring threats of reductions in duties on our strategic metals is a serious deterrent to domestic production. Representatives Compton I. White of Idaho, James F. O'Connor of Montana, and James G. Scrugham of Nevada, voiced the protest that the removal of protective duties would wipe out the tungsten industry in the United States.

In the meantime it is known that negotiations are still under way for the removal of Canadian-United States-Latin American duties for the duration of the war. While this will probably come within the next two months by legislative action, it is highly important that prevailing domestic prices be maintained, in order not to upset the present balance and halt vitally

needed production of the strategic metals.

Morgenthau on Silver

Made public the first week in February, the testimony of Treasury Secretary Morgenthau before a House Appropriations Subcommittee aroused the intense interest of producers of lead, zinc and copper ores carrying silver. When questioned by a committee member concerning Treasury purchases of silver, the Secretary said: "So far as I am concerned I will be glad to see Congress strike all of the silver legislation off the books." He added that right now there is more and more industrial use of silver, that it has grown by leaps and bounds and that the increase in the use of silver has been simply amazing. It was also stated during the hearing that the monetary value of the total silver stock is now \$4,200,000,000 and that this amount is just under 16 percent of the total monetary stock (gold and silver) of the United States; also, that there is approximately \$2 of gold and silver on hand for each dollar of the currency issued. Not brought out at the hearing but emphasized in subsequent statements by western members of Congress and mining men,

was the importance of the present statutory price of domestic silver in maintaining production of the base metals from mines in which silver is a by-product.

When the Treasury-Post Office Appropriations bill was under consideration on the floor of the House, there was a very close vote on a "rider" amendment offered by Representative Dirksen, a Republican of Illinois, which would have eliminated the appropriation to pay salaries or expenses of the Silver Division in the Treasury. The amendment was intended to hamstring administration of the Silver Purchase Act of 1934 but failed by a 2-vote margin.

WPB Aids Mining

While from the Truman Investigating Committee and other sources have come varying degrees of criticism of the War Production Board and its predecessor the OPM, concerning the production of critical and strategic metals, this level-headed and silently striving agency has actually been stimulating and securing real results. From the beginning it has counseled with metal producers and has pushed most energetically with the Reconstruction Finance Corporation,

the Metals Reserve Company and the Defense Plant Corporation for the increased development of ores and for vast expansion of mining, milling, smelting and refining facilities. The work of the War Production Board has not been spectacular, the Board did not seek publicity—in fact quite the reverse—but its efficient hammer blows have been hitting squarely on the spike-head.

As an excellent example of performance, attention may be called to the Mines Priorities Branch, which since September, 1941, has been functioning so effectively in the Materials Division, to insure a continued supply of machinery and supplies to keep the mines going. Aply and untiringly the Mining Branch, under Dr. Wilbur A. Nelson and an efficient and well-trained staff, has developed and adminis-

(Continued on page 46)

A SPECIAL MESSAGE TO CONGRESS



—CHARLESTON DAILY MAIL

Forty-Fourth Annual Meeting of American Mining Congress Held in Cleveland

BRINGING out the largest attendance in many years, the Forty-fourth Annual Meeting of the Congress convened in the Statler Hotel in Cleveland on February 6. Called to order in the iron ore capital of the nation by President Howard I. Young, there were represented among the delegates, in addition to many iron ore producers, mining men from the bituminous coal and anthracite regions and producers of lead, zinc, copper, manganese, chrome, tungsten, quicksilver, antimony, gold, silver, and other metals and minerals from the western mountain and desert regions and the Pacific coast, as well as manufacturers of both coal and metal mining machinery and equipment.

In his introductory remarks President Young referred to the work of the American Mining Congress and of the results of that work, which he said from month to month and year to year speak for themselves. Continuing, he spoke of the new War Production Board created in Washington under the able leadership of Mr. Donald M. Nelson and of Mr. James S. Knowlson, Director of Industry Operations, who is devoting his time to converting civilian industry into active war production. He then introduced Mr. Knowlson's assistant, John H. Martin, who had come to Cleveland in answer to the industry's request that the War Production Board tell the mining men of the country what it proposes to do and how they can best serve the Government and the country in the present war effort.

WPB Plans Outlined

In his address Mr. Martin said that pointedly the job is to produce 340 airplanes a day, about 200 tanks a day and 2 ships a day; that the big job is coordination and that the War Production Board was created to coordi-

nate the efforts of American industry. He emphasized that all of the WPB work and all of the OPA work and everything else is merely to add the "trimmings" and to help American industry to do its job in turning out the vitally needed war materials. The main difference, he said, between the WPB and the former OPM lies in the fact that the WPB is a war organization, created to get things done quickly, and that there are now direct lines of authority whereby a man at one level in the organization can either make a decision or pass it to the man above him for expeditious handling.

There are three chief bureaus in the WPB, said Mr. Martin, the Raw Materials Division, under W. L. Batt, charged with making raw materials available; the Production Division, under W. H. Harrison covering ordnance, ships, tanks construction and machine tools and tying directly into the Army and Navy work, and the Division of Industry Operations under J. S. Knowlson, embodying the Priorities Bureau and the Bureau of Industry Branches. Industry branches will cover the civilian industries which have to be converted to war work and the Priorities Bureau must coordinate all of the priorities or allocations steps which may have to be taken. In speaking of the Mines Priorities Branch, under Dr. Wilbur A. Nelson, Mr. Martin said "I will make a flat statement that among industries mining machinery is number one in priorities." He then urged the mining men present to carry out Dr. Nelson's request and to get their requirements for machinery for the mining industry to the manufacturers just as soon as possible, so that the Division may have a definite idea of what the load upon the mining machinery producers is going to be.

In closing, Mr. Martin told the meeting that the mining industry is very fortunate in that it has a clear-

cut directive, far different from the automobile industry, the refrigerator industry or the radio industry. The mining industry, said he, has just one job and that is to get more raw materials above ground. When asked concerning the relationship between the Priorities Bureau and the Army and Navy Munitions Board the speaker stated that Mr. Knowlson, as director of the Division of Industry Operations, has all the priorities powers, and the priorities authority of the Army and Navy Munitions Board is authority delegated from Mr. Knowlson.

Expressing appreciation to Mr. Martin for his stirring message, President Young gave earnest assurance that every man in the mining industry will do his utmost to carry out the program laid out by the War Production Board.

Mr. Young then called upon Secretary Julian D. Conover, who presented his annual report for the year 1941. Mr. Conover reviewed particularly Federal legislation affecting mining and discussed the work of the American Mining Congress in cooperation with the departments and agencies of the Federal Government. His report is carried in full in this issue.

Next, Finance Committee Chairman Erle V. Daveler presented the report of his committee and told the members that the Congress hoped to carry on through 1942 under its assigned budget. In expressing the appreciation of the members and officers to the Finance Committee, the President recalled the very material improvement which the committee had brought about over the past several years.

Heavy Taxes Coming

For the Tax Committee, Chairman Henry B. Fernald emphasized that in the present emergency we must get out the needed metals and minerals even



Luncheon and Directors Meeting

though it means selective mining, deferred development and operation of equipment to the breaking point. He said, however, that there is one point that the tax makers must be made to realize, namely that this stringent necessity for production does not warrant a tax program that will wreck business—that will not give additional production but will actually hurt the production of coal, iron ore, non-ferrous metals and particularly of strategic metals throughout the country.

Mr. Fernald then presented Ellsworth C. Alvord, AMC Counsel, who spoke on the Federal fiscal situation. Mr. Alvord discussed the 1943 Federal budget as submitted in January, showing total expenditures of \$59,000,000,000, with indicated receipts of \$16,000,000,000 under the present revenue laws. He stated his belief that receipts have been under-estimated and that the revenues may reach \$19,000,000,000; thus total receipts, if the additional \$9,000,000,000 requested in the coming revenue act of 1943 is provided, would reach \$25,000,000,000 to \$28,000,000,000. Mr. Alvord then discussed means by which the additional revenue of \$9,000,000,000 might be secured, including increases in individual and corporation rates, withholding taxes, sales taxes, and plugging of the so-called loopholes. He then spoke of several sources which the Treasury officials are investigating in their search for available money to be invested in Government securities. One of these is the funds available in depletion and depreciation reserves, and another is current savings in the country, up to the

amount of possibly \$12,000,000,000. Still another source is through borrowing from the commercial banks and if the situation becomes sufficiently difficult Mr. Alvord thought that the Treasury might go to the commercial banks for at least a part of the needed financing. Again, a possible source would be to authorize Treasury borrowings from the Federal Reserve System by merely passing Treasury notes to the FRS in exchange for credit.

Reference was then made to the Treasury attitude toward the depletion deduction for mines, and the speaker stated his belief that the coming legislative situation on depletion is going to present a real problem for those in the industry who would preserve the provisions of the present law.

In view of the difficulty of estimating revenue yield, and in his belief that too high rates of corporation taxes will do harm, Alvord suggested going to outside sources for substantial additional revenue. He stated that a 10 percent sales tax would produce approximately three to three and one-half billion dollars, but that the Congress does not seem disposed to pass that kind of a tax. A 5 percent withholding tax on wages and salaries, and a like tax on all income and compensation of all kinds, including dividends and interest paid to individuals, would produce about four billions. He predicted that the post-war experiences of the nation will be much better if the Treasury and the Congress will follow the latter suggestion.

Mr. Young then called on Chairman Howard Houston, of the AMC

Committee on Social Security, who discussed the pending program which would practically double the amount of social security taxes. The proposed increases, he said, would be 2 percent on employers and 2 percent on employees for old-age benefits and 1 percent, either on the worker or divided between employer and employee, for unemployment insurance. He pointed out that the plan calls for broadening the coverage to include farm workers, domestic workers, self-employed, and Government workers. He reported that under present plans Congress will refuse to consider the social security increases until after disposal of the revenue bill.

Opposes St. Lawrence Waterway

Vice President Alex C. Brown, Cleveland Cliffs Iron Company, reported on the legislative status of the St. Lawrence Seaway and Power Project. He told the meeting of the work of the American Mining Congress, acting with the St. Lawrence Project Conference, in presenting the position of the mining industry to the House Committee on Rivers and Harbors and to the public. Mr. Brown, who also appeared against the St. Lawrence Project before the Rivers and Harbors Committee to present facts concerning the iron ore industry, registered a vigorous protest against inclusion of the new Soo Canal lock in the pending "Omnibus" bill. He particularly protested the refusal of the committee to report this project separately, in order that the locks may

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War and Navy Departments operate day and night

Mining Congress Aids Industry in War Effort

- ***Julian D. Conover, Secretary, reviews Mining Congress' services to operators and manufacturers 1941-42. Mr. Conover's report was made at the Annual Meeting of the organization recently held in Cleveland.***

MR. PRESIDENT and Gentlemen: I will try to make this report brief.

The scope of our work in the past year has been greatly enlarged. Legislation affecting mining has required close attention, and the many wartime agencies of government have called for constant activity in presenting the position and needs of our industry.

The year has witnessed a growing unity of effort on the part of mineral producers throughout the country. Local and state organizations have been strengthened and closer relationships established between them and mining's national organization in Washington. In California, following our Western Convention, the various mining associations came together under a common banner for the first time in many years, forming a California Chapter of the American Min-

ing Congress. A similar chapter was organized in Montana. Through these local organizations and through our own widespread membership, contact is maintained with many thousands of metal, coal, and non-metallic mineral producers in all parts of the country.

The work on operating problems carried on by our Coal Division has likewise grown. Over 150 men, recognized as authorities in their fields and representing both operators and manufacturers, are serving on the various committees which are compiling useful data on all phases of modern coal mine practice. Representatives of the U. S. Bureau of Mines and of state mining and geological departments cooperate in this work; and such cooperation is especially important in our Committee on Safety, in view of the many new problems connected with federal inspection of coal mines. For the coming year, Harry

M. Moses, President of the H. C. Frick Coke Company, has agreed to accept the chairmanship of the Coal Division, the duties of which have been so ably discharged by Mr. R. L. Ireland, Jr., for the past three years.

Reports of the Coal Division committees are presented to the industry through the MINING CONGRESS JOURNAL. The Journal, covering the entire mining field, has continued to grow in influence, in reader interest, in circulation and in advertising.

Legislation considered in the 77th Congress has covered a wide range of subjects of deep concern to mining. I will touch briefly on some of these.

St. Lawrence Project Active

Of special interest to iron ore and coal producers, who are so well represented here, is the St. Lawrence Waterway and Power Project. We have consistently and strenuously opposed this. We have pointed out the wasteful expenditure of public funds which it involves; the harm to existing mining industries and communities, both coal and metal; the discouraging effect upon development of our immense lower grade iron ore reserves, and the consequent threat to our fu-

ture national security; and the drain upon manpower and materials for a project which could not be completed in time to contribute to the war program. Coordinated effort of those opposing it has thus far prevented any action by Congress. However, passage of an authorizing bill will be sought very shortly, under the guise of national defense, and the situation is likely to be serious.

Mining Has Serious Problems in Tax Bills

Tax legislation has again moved rapidly, with two new laws in 1941.

The first of these amended the 1940 excess profits tax, giving relief from some of its provisions. It eliminated the need of making a binding election between the average earning basis and the invested capital basis at the time of filing a return; instead, it permits computing the tax in both ways, and payment on the more favorable basis after final audit has been made. It also provided a two-year carry-over of unused excess profits credits, and contained relief provisions which are helpful to mining companies in the development stage.

The Second Revenue Act of 1941 brought heavy increases in rates, which we recognize as needed in paying the war cost. Our position has been that we must pay whatever taxes are required, but we must be careful as to the form of these taxes, that they are not such as would cripple the industry or prevent it from producing the minerals so urgently needed today. During the consideration of the bill an attack upon the average earnings credit was warded off, and a special 10 per cent tax on companies using the invested capital credit was finally eliminated. On the other hand, the Act reverses all previous procedure by levying the excess profits tax on the entire net income, including that portion used to pay normal tax. Provisions of special importance to mining which were not adopted were:

First, the Johnson amendment to permit a credit based on the normal profit per unit of production. This would recognize that when a mine increases production, in response to the nation's urgent need, and thus exhausts its capital assets more quickly, it does not realize an excess profit unless the net return *per unit* is greater than normal.

Second, a general relief provision to cover cases of special hardship to

which the present limited provisions do not apply.

Third, continuance of the exemption for strategic metals as contained in the 1940 law. Senator McCarran of Nevada has introduced an amendment to restore this provision in the next Revenue Act.

Recognition of mining's problems was given by the chairman of the Senate Finance Committee, who expressed the opinion that the mining industry should be given separate and special treatment. Consideration was promised in an "administrative amendments" bill to be considered last fall. Such action, however, was deferred to the 1942 tax bill, on which hearings are to begin shortly. Meanwhile, conferences with the special tax advisers of the Treasury and the Congressional Committees on Internal Revenue Taxation have been held recently, at which our viewpoint has been presented.

Here in Cleveland a few weeks ago the Secretary of the Treasury made a severe attack upon the present allowances for depletion. It is evident that percentage depletion, as finally established for mines in 1932, is under heavy fire, and that we must give it close attention in the coming revenue bill.

Labor Legislation

The Wage-Hour Act has continued to be a source of difficulty and harassment to mining operations. The collar-to-collar ruling for metal mines, announced last March, abrogated established practices and was completely at variance with a previous ruling for bituminous coal mines. The 40-hour week and overtime requirements are being seriously questioned today as being inconsistent with the need for maximum production of war materials.

Legislation to curb strikes and work stoppages has been stalled several times by labor opposition. If the new War Labor Board fails to solve the problem, or if it becomes bogged down under further pressure for the closed shop, strong anti-strike legislation, such as passed the House two months ago, may be brought out of a Senate committee pigeonhole and enacted into law. As a matter of fact, many in Congress, including the House Naval Affairs Committee, already take the definite stand that such a law is needed *now*, to prevent further work stoppages that imperil the war program.

Proposals to alter our protective

tariff structure have recurred in recent months. The most far-reaching are the proposals to remove all trade barriers in the western hemisphere, as discussed by the joint Canadian-American Commission and with Latin American nations at Rio. We have made no objection to such moves insofar as they will expedite war production; but we do take the definite position that their life should be limited to the "duration," and that established prices of domestic mineral products should be protected.

Stream pollution bills are fortunately inactive for the present. The drastic federal control measures, which we have consistently opposed, are wisely not being agitated in this hour of emergency.

Federal Mine Inspection

Federal inspection of coal mines is now proceeding under a law enacted last May. The final act was materially changed from the original version opposed by the mining industry. The provision which would have permitted inspections to be used as a club for union purposes was eliminated. The inspection service was placed under the Bureau of Mines, with its trained personnel, and provision was made for properly qualified inspectors selected on merit. Cooperation with established state agencies is required. Functions of the federal inspectors are limited to the making and publicizing of recommendations for improvement of safety conditions. Our Coal Division Committees are giving to those in charge of federal inspection the full benefit of their knowledge and experience, and the industry is cooperating to the end that the best results may be achieved.

A bill diverting the statistical work of the Bureau of Mines to the Census Bureau, and multiplying the reports required from mineral producers, was strongly opposed before a House committee. We urged that all of the government's mineral statistics be centralized in the Bureau of Mines and handled by men who understand the industry's problems.

Extension of Leasing System

Renewed efforts to extend a leasing system to all metals and minerals on the public domain have likewise been opposed. A Public Lands Subcommittee has been fully advised of the mining industry's stand, that the long established system of discovery, loca-

tion and patent of mineral claims must be continued.

So much for legislation which specifically concerns mining.

Congress has voted the President or his appointees most of the extraordinary powers that have been requested, and today we have the most strongly centralized government in our history. The conduct of the war is and must be in the hands of the executive branch and of the new agencies which have called into service some of the best brains in American industry.

A major part of our work today is naturally with these agencies. I will not try to describe the many ways in which they have called upon us, nor the many matters in which members of the industry have availed themselves of our services. Constant contact has been maintained with the various divisions of the OPM—now the WPB—the OPA, the OEM, the Solid Fuels Coordinator, the Metals Reserve Company and Defense Plant Corporation, etc., as well as with the permanent agencies throughout the Federal Government.

Priorities Obtained for Mining Equipment

I do wish to mention one field in which the entire mining industry has been deeply concerned, that of priorities on needed equipment and operat-

ing supplies. For many months this question has required close attention, with operators and manufacturers working together through our office to secure consideration for the industry's needs.

Our position has been simple and clear-cut. The weapons of war cannot be made without metals and coal. Metals and coal cannot be produced without machinery, repair parts and current operating supplies. Machinery and supplies cannot be had unless the manufacturers can procure the necessary raw materials. Hence provision *must* be made to insure a continued flow of materials to the mine equipment manufacturer, and of machines, parts and supplies to the mineral producer. The products of the mines are basic to the entire program of armament production.

Fortunately those in charge of priorities became convinced of this fundamental truth. After numerous conferences and submission of exhaustive data, a blanket preference rating for the manufacture of mining machinery was issued in July. This was followed in September by a special maintenance and repair order, under which—as stated by an OPM representative at our San Francisco meeting—mining was the first major industrial classification recognized as not simply essential but as being of primary importance. A further significant step

was the creation of a separate mining branch in the OPM headed by Dr. Wilbur A. Nelson. Thus all mining priorities may be cleared through one man, possessed of a thorough and sympathetic understanding of the industry. Additions and supplements to these early orders have likewise been secured, and we have tried to keep you posted on all such developments.

With constantly increasing demands for the various critical materials, the priorities situation is becoming steadily more acute. Higher and higher ratings are becoming necessary, the sale of certain materials is limited by restrictive orders, and direct allocation of many of these materials is in prospect in the not-distant future.

Conferences with WPB officials are being held to meet this new situation. Data as to essential requirements for both new equipment and maintenance are being submitted, and we are encouraged in the belief that mining will again receive the recognition warranted by its primary importance to the whole war program.

Aid Given to Strategic Minerals

In the interest of small or prospective producers of strategic metals, persistent endeavor has been made to have information published concerning the grades which will be accepted and prices which will be paid by the



Tremendous tonnages of coal, mined, screened and properly prepared, are vital to victory



Uninterrupted flow of copper from modern well-equipped plants is essential to wartime industries

RFC. Late in 1941 complete specifications and prices for manganese and chrome ores were made public. The minimum grade requirements were materially reduced and arrangements made for field sampling and purchase of small lots. These steps should stimulate the development of many small deposits and in the aggregate should bring out a substantial tonnage.

Further means whereby the RFC may aid in developing small mining properties is provided in a bill introduced by seventeen western Senators. This would make available loans up to \$5,000 for unwatering, retimbering,

and preliminary development of promising mining properties which do not have developed ore reserves.

The SEC requirements for sale of mining securities have been further liberalized in the past year. Following issuance of new regulations covering the exemption of security issues of \$100,000 or less, a simplified form, S-3, for registration of primary mining enterprises was issued in September, 1941. These steps carried out in part the recommendations of our committee, and will be helpful to the industry in the future.

In closing, we all recognize that or-

dinary standards and methods are today out the window. The one supreme task before us is to win the war. If we fail in that nothing else matters. The mining industry has the terrific responsibility of furnishing the metals and solid fuels which are the backbone of war production. It will discharge that responsibility to the very limit of its capacity. The entire staff of the Mining Congress is deeply appreciative of their opportunity to serve the industry and the nation in the accomplishment of this task. They pledge their services without stint in the critical times which lie ahead.

Forty-fourth Annual Meeting

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be available for the passage of lake cargoes at the earliest possible date.

W. J. Jenkins, a director and member of the Executive Committee of the American Mining Congress, urged the industry to continue full cooperation with the United States Bureau of Mines in carrying out its administration of the Federal coal mine inspection law. Of the 117 inspectors to be appointed, he said, one-third are now at work and another third will be in the field very soon. Mr. Jenkins pointed out that this is a work in which the Safety Committee and other committees of the Mining Congress

Coal Division are giving active assistance. Speaking next of the Federal Explosives Control Act, he told the industry that the U. S. Army officials are becoming very impatient and are insisting that administration of the act be immediate and drastic, particularly with reference to powder magazines and storage facility practices, including the methods of distribution. He urged mineral producers to take extreme care to comply with the explosives regulations and with the amendments to these regulations which will be issued from time to time.

An enthusiastic preview of the coming American Mining Congress Coal Convention and Exposition at Cincinnati, the week of April 27, was given by the convention program committee chairman, J. Noble Snider,

vice president of Consolidation Coal Company. Members of the industry were assured that real value to them would result from their attendance with as many of their staff men as possible. Pressing the theme of the convention "Coal will win the war" he emphasized that the Coal Show at Cincinnati will be an "industry clinic" for operators and manufacturers, in which all must participate if the coal mining industry is to do its job.

Directors and Officers Elected

As chairman of the Nominating Committee, S. H. Williston, of Oregon, submitted a report, recommending the election of the following to serve as directors for a three-year term: Donald A. Callahan, president,

Lexington Mining Company, Wallace, Idaho; Louis S. Cates, president, Phelps Dodge Corporation, New York, N. Y.; Clinton H. Crane, president, St. Joseph Lead Company, New York, N. Y.; James D. Francis, president, Island Creek Coal Company, Huntington, W. Va.; Herbert C. Jackson, member of pickands Mather & Company, Cleveland, Ohio; and William J. Jenkins, president, Consolidated Coal Company, St. Louis, Mo. The report of the committee was accepted and the industry leaders thus named were unanimously elected as directors of the organization.

As a fitting close to an interesting and valuable meeting, Resolutions Committee Chairman Donald A. Callahan reported on the work of his committee. He told the meeting that in this serious national emergency they had confined the proposed Declaration of Policy to a pledge to the Government of the United States of complete cooperation on the part of the mining industry in the task of carrying the war to a successful conclusion. The declaration urged full recognition by management, labor and stockholders of the responsibility which each

must accept in order that maximum production be obtained. Reaffirming mining's position on the necessity of equitable employee-employer relationship, sound fiscal policy, the elimination of non-essential Government expenditures, and all else essential to the prosecution of the war, the declaration pledged the industry to work and produce for Victory. In a ringing voice Senator Callahan moved the adoption of the resolution, which was carried unanimously by a rising vote.

At the conclusion of the members' meeting, the Board of Directors met to discuss policies and complete the work of organization for the coming year. The following officers were unanimously elected: President, Howard I. Young, president, American Zinc, Lead & Smelting Company, St. Louis, Mo.; First Vice President, D. D. Moffat, vice president and general manager, Utah Copper Company, Salt Lake City, Utah; Second Vice President, Donald A. Callahan; Third Vice President, James D. Francis; Secretary, Julian D. Conover; and Executive Committee, Howard I. Young, D. D. Moffat and William J. Jenkins.

Wheels

(Continued from page 39)

tered Preference Rating Orders for coal, metal and non-metallic producers, as well as additional orders and allocation procedures for the manufacturers of mining machinery, equipment and parts. The latest amendments to these orders are described more fully on page 50.

The deadly serious job of winning the war is continuing to gain effective impetus through the work of the mining men in the WPB, and their intelligent coordination of efforts to increase production of needed materials has resulted in incalculable savings to the Nation.

Must Stock Coal

Spurred on by men like T. J. Thomas and General Brice P. Disque, and benefiting by their thoroughgoing experience in the industry, the Solid Fuels Administration, joining with the War Production Board, is pushing a program to build up large inventories of coal and coke as a provident safeguard against the time when transportation difficulties or shortages may otherwise cause the suspension of pivotal operations. General inventory order M-97, from the

WPB Division of Industry Operations, has made it clear that there are no inventory restrictions on coal and coke, and that railroads and industrial users may prepare ample stockpiles while the mines and railroads are still functioning freely.

Appearing before the House Interstate Commerce Oil Subcommittee, Petroleum Coordinator Ickes recently warned of an approaching shortage in heavy fuel oils for industrial use on the East Coast. In this connection the Coordinator stated that he is urging industrial consumers to stock coal to prevent shortages through lack of transportation; also that in order to conserve stocks of petroleum, many industrial plants now using heavy fuel oils are being instructed to change over and burn coal.

An Advisory Committee to the office of Solid Fuels Coordinator was appointed in mid-February, with the following personnel:

Bituminous—George W. Reed, vice president, Peabody Coal Company; Charles O'Neil, Barnes & Tucker Company; H. T. DeBardeleben, president, DeBardeleben Coal Company; and O. L. Alexander, president, Pochontas Fuel Company.

Anthracite—Charles Huber, chairman, Glen Alden Coal Company; and

James H. Pierce, president, East Bear Ridge Company.

Mine Labor—Percy Tetlow, technical adviser, UMWA and Thomas H. Kennedy, secretary-treasurer, UMWA.

Coke—D. M. Rugg, vice president, Koppers Company.

Rail Transportation—J. J. Pelley, president, Association of American Railroads, and W. C. Kendall, chairman, ARA Car Service.

Public Interest—Dr. Walter Dill Scott, president emeritus, Northwestern University, and Louis J. Brann, former Governor of Maine.

Explosives Regulations Severe

Delays in printing and in the appointment of agents have caused the Explosives Control Division, Public Health and Safety Branch, U. S. Bureau of Mines, to issue a further blanket license on the handling of explosives, expiring March 16 at midnight. In the meantime intensive work is being done on the development of regulations affecting powder magazines and storage houses, as well as the methods of distribution of explosives throughout the mining industry. It is understood that officials of the Army are pressing for drastic regulations and for speed in their promulgation. Many instances of unsafe handling are being reported and a great deal of trouble will be saved if mineral producers will inquire closely into their own distribution procedures and take corrective steps as quickly as possible.

To Open Stripping Operation

The Central States Collieries, Inc., of St. Louis, Mo., is developing a strip mine near Cuba, Ill., to be known as the Sunnyside. This property will be the second large stripping property of the company, the first being the Little Sister Mine at St. David, Ill. Coal from the Sunnyside will be transported to the preparation plant of the Little Sister Mine for treatment.

Utah Copper Above Rated Capacity

The output of copper in Utah in 1941 was by far the greatest in the history of the state. It was 525,154,000 pounds, a gain of 61,426,000 pounds over 1940. Substantially all of the total increase was made by the Utah Copper Co. which operated at one-third over rated capacity all year. The open pit mine at Bingham was operated on a seven-day schedule; at the end of the year, ore shipments to the mills averaged about 88,000 tons per day.

Both the Magna and Arthur concentrating mills were operated above rated capacity. The company retained its rank as the largest single producer of copper in the United States.

PERSONALS



Carrying on for the Rocky Mountain Metals Foundation, **James A. White** has



taken up the work interrupted by the passing of the late Walter Trent. "Jim" White first came to Washington 25 years ago with the distinguished Senator Francis E. Warren of Wyoming and with the ex-

ception of two years service as Lieutenant of Engineers in France with the A. E. F., has since continued his work between Washington and the West. For a number of years until the passing of Senator Key Pittman of Nebraska, he was Clerk of the Senate Committee on Foreign Relations and as such assisted the Senator very ably in his wide range of activities. From August, 1935, until January, 1941, he served as Secretary of the Senate Special Silver Committee, organizing and carrying on this work under the direction of Senator Pittman. More recently he has been engaged in special work for the State Department.

The mining industry gladly welcomes "Jim" White in the assumption of his new work for the non-ferrous and precious metals.

F. H. Cash of Hibbing, Minn., formerly in charge of the Minnesota iron mines of the Republic Steel Corp., has been appointed general manager for the Lake Superior District. He has charge of the company's mines in both Minnesota and Michigan.

Walter Webb, who heretofore was in charge of the Republic's Michigan iron mines, becomes superintendent of the Penokee mines in that state.

George E. Lynch, consulting engineer for Phelps Dodge on dust and fume problems in the company's Morenci plant, now nearing completion, is undertaking similar work for Basic Magnesium, Inc., at its \$63,000,000 project in Nevada.

W. L. Affelder, vice president of the Hillman Coal and Coke Co., was recently elected to the Board of Directors, National Coal Association. Mr. Affelder takes the place on the Board of C. W. Gibbs, retired.

E. R. Lovell, general manager of the Calumet and Hecla Consolidated Copper Company, was elected a director of the company on January 21.

In Washington in late February arranging for a coking coal supply for the new steel industry in eastern Texas, President **J. G. Puterbaugh**, of the McAlister Fuel Company and other southwestern enterprises, conferred with several of the new war agencies.

L. K. Requa, president and manager, Idaho Almaden Mines Co., was called recently to duty with the United States Marines in which he holds a reserve commission.

C. E. Nighman, international mining expert and former acting assistant to Dr. R.

R. Sayers, Director of the Bureau of Mines, has been appointed chief of the Explosives Control Division in charge of the administration of the Federal Explosives Act. Mr. Nighman will act for the director in issuing licenses to qualified makers and users of non-military explosives under an act passed by Congress in the first World War and amended December 26, 1941.

Selling practices, including retail distribution of coal under Price Administrator Leon Henderson, will come within the range of duties of **Irwin Davis** of Cincinnati, who is now a member of the Industry Council and Consultant on fuel distribution in the OPA. Mr. Davis is the well-known president of Hatfield-Campbell Creek Coal Co.

J. G. Green, of Milwaukee, Wis., has been made assistant general manager of the Storage Battery Division of Philco Corporation, effective February 1. Following his graduation from Pennsylvania State College, where he specialized in Electrical Engineering, Mr. Green was connected with Westinghouse Electric & Manufacturing Company for eleven years. In 1935 he established the J. G. Green Company in Pittsburgh to provide engineering services and to act as manufacturers' agents. Since January,



1940, Mr. Green has been assistant sales manager of the Louis Allis Company.

T. B. Sturges has been re-elected president of the Pennsylvania Drilling Company. **F. C. Sturges** was elected vice president and general manager, and **John H. Melvin**, treasurer.

Robert C. Fenner was recently elected president of the Consumers Company, Chicago.

Leroy Hall is now associated with the Banner Mining Company at Lordsburg, New Mexico, after having completed a contract with Cia Minera de Oruro in Bolivia.

Raymond F. Evans, a director of the Diamond Alkali Company, and formerly vice president in charge of research, has been named president of the Diamond Magnesium Company, a subsidiary which has recently been formed to operate a large magnesium plant for the Federal Government to be erected at Painesville, Ohio.

John Mitchell, formerly with the U. S. Smelting, Refining & Mining Co., left recently for South America, where he will work with the Pato Consolidated Dredging Company in Colombia.

John W. Melrose has been appointed as geologist and head of the Washington division of mines and mining of the Chicago, Milwaukee, St. Paul and Pacific Railroad. He will conduct a mineral survey to aid commercial development of mineral resources in the State of Washington. Headquarters will be in Spokane.

Edward D. Dickerman is in charge, assisted by **J. A. Lintner**, of a survey being conducted by the State Mineral Resources Board, the Colorado State Mining Association, and the Metal Mining Fund, to determine the mineral resources and available strategic minerals of Gilpin County, Colo.

Rufus G. Poole, principal draftsman of the Federal Wage and Hour Law, and primarily responsible for its interpretative framework, is now associated with the law firm of Davies, Richberg, Beebe, Busick & Richardson.



J. J. Inman has been appointed district manager of mines in the Tri-State district for the American Zinc, Lead & Smelting Co.

W. P. Goss, mine superintendent at the O'okiep Copper mines in South Africa has been vacationing in the United States.

L. Metcalfe Walling, former Rhode Island State Labor Commissioner, was nominated by President Roosevelt recently to be administrator of the Wage and Hour Division of the Labor Department. He has been acting administrator since Brig. Gen. Philip B. Fleming left that post to become Federal Works Administrator.

F. M. Connell, president of Con-west Exploration Company, Ltd., and Mt. Zeballos Gold Mines Co., Ltd., in British Columbia, has been appointed deputy metals controller in Canada.

Charles M. O'Brien has been appointed head of the fuel division of the Better Business Bureau of St. Louis. He was formerly connected with the Mt. Olive & Staunton Coal Company. Mr. O'Brien will cooperate with the weights and measures departments of various municipalities, handle fuel complaints, check for accurate description and proper weight of fuel, and other duties associated with the office.

Kenneth Gerard has been made manager of Utah operations for the Vanadium Corporation of America. He will make headquarters at Monticello, Utah, where the company is to erect a large mill.

Russell C. Fleming, formerly editor of Mining Congress Journal,



left on February 6 for South America as technical consultant on coal resources of Brazil. Mr. Fleming, under the auspices of the Coordinator of International American Affairs, will investigate the coal resources and direct the exploration and development of coking and steam coals for steel plant and industrial uses.

Arthur F. Johnson has recently joined the staff of the smelting division of the Reynolds Metals Company aluminum plant at Listerhill, Ala. He was formerly in charge of the development program at the Silver Lake mine, Silverton, Colo., and previous to that had been employed by the American Smelting and Refining Company in West Australia.

Philip D. Reed, chairman of the board of directors of the General Electric Company, was appointed on January 24 to head the Industry Branches in the Division of Industry Operations of the War Production Board.

James F. Bryson has been appointed general manager of the Black Star Coal Company and the Pioneer Coal Company, with headquarters at Alvah, Ky. Mr. Bryson has been safety director of the Harlan County Coal Operators Association for the past 14 years.

Martin C. Duffy of Goldfield, Nev., has been made superintendent of the Goldfield Deep Mines Co.

— Obituaries —

The passing of the former governor of Colorado, Jesse F. McDonald, on



February 25, marked the close of the brilliant and useful career of the dean of Rocky Mountain mining men.

A former vice president of the American Mining Congress and former chairman of the western division, he also served for many years as governor of the Colorado chapter and president of the Colorado Mining Association. For many years active in the operation of mining properties at Leadville and other points, he constantly led in state and national mining circles and his sterling qualities of worth, integrity and true friendship will be long and affectionately remembered by mining men of the nation.

John F. Telfer died on December 1, after a short illness, in Burlingame, Calif.

As a young man he followed mining, and in the employ of Bewick-Moreing and Co. was sent to distant outposts. He spent a period of years in charge of gold properties on the Gold Coast of West Africa and in Western Australia.

Coming to the United States about 30 years ago, Telfer was employed as an engineer with Arizona copper properties, including the Copper Queen at Bisbee. He subsequently worked for Chas. H. Segerstrom in San Francisco and at Sonora, Calif.; and for other interests at various California properties including the Atolia, Beebe, and Pine Tree mines.

When the Bradley Mining Co. took over the production of mercury at Sulphur Bank, Calif., in 1927, Telfer moved into a position as accountant that lasted 13 years, less a few intervals. It was the job he held when in 1939, failing health forced his retirement from active work.

Raymond Denver Butterfield, superintendent of the Reed Mine, Yolo County, Calif., died of a heart attack on December 4 in the mine office.

Butterfield was born in Denver on March 28, 1892, and started working underground at the age of 16. He made his first stake at the Vindicator Mine when 19 years old. Through the years he leased and operated in the Ward, San Juan, Gunnison, and Cripple Creek Districts.

Going to California, he worked for three years on the driving of the Hetch Hetchy Tunnel. In 1933 he became superintendent of the San Juan Mine, a gold property operated by the

Bradley Mining Co. in Nevada County, Calif. In early 1939 he was moved to the Reed, a quicksilver property.

Halleck W. Seaman, long active in mining in the Middle West, died at his home in Clinton, Iowa, on December 15 at the age of 81 years.

Mr. Seaman was president of the Trojan Mining Company for more than 20 years, and during this time was actively interested in the work of the American Mining Congress, serving as president of the organization in 1923.

Surviving are his wife and a son, Dwight S. Seaman, of Clinton.



H. V. Croll, for many years general sales manager and western district manager of Traylor Engineering and Manufacturing Company, died at his home at Alhambra, Calif., on January 27.

Mr. Croll was an outstanding copper smelting engineer, having occupied prominent positions in that industry prior to identifying himself with the Traylor Company about 30 years ago.

Lewis Albert Bassett, president of the Hendrick Manufacturing Company, Carbondale, Pa., died at his home in Carbondale on January 2.

For over 50 years he had been one of the leaders in the industrial and civic life of Carbondale and the Lackawanna and Wyoming Valleys, sharing generously his talents and means for the general advancement and welfare of the communities.

Elmer S. Olmsted, 68, vice president and sales engineer of the Cheatham Electric Switching Device Co. and Nachod and United States Signal Co. of Louisville, Ky., died on February 9, after an illness of several months. Mr. Olmsted had been associated with the above companies over a period of more than thirty years. Previous to that time he was with the Boston Elevated Railway Co. as electrical engineer.

G. Cook Kimball, executive vice president, United States Steel Corp. of Delaware, at Chicago, died January 12, at Passavant Hospital after a long illness.

Mr. Kimball, who was 62 years old, had spent his entire business career in the steel industry beginning as an engineer with American Tin Plate Co. in 1901 after his graduation from Harvard University. He was executive vice president, Carnegie-Illinois Steel Corp. from 1935 until April, 1939.

George H. Dormer, of Ishpeming, Mich., superintendent on the Marquette iron range for the Oliver Iron Mining Co., died January 25 in Rochester, Minn., of a heart attack, at the age of 67.



NEWS and VIEWS

Colorado Association Meeting

The Colorado Mining Association held their 45th annual meeting in Denver on January 23 and 24. Featured events, in addition to the three technical sessions, were a parade through the city streets, a mining show including a rock drilling contest, a mucking contest, a safety contest, and exhibits of equipment and supplies; and the famous Sowbelly dinner attended by an overflow crowd of more than 1,500 people on Saturday night, January 24.

The banquet crowd on the evening of January 23 was addressed by the honorable G. C. Bateman, Metals Controller, Department of Munitions and Supply of Canadian Government, on the subject of "Metals for Defense"; he spoke at length of the manner in which Canada is meeting her wartime mineral needs. The second speaker was the Honorable Oscar L. Chapman, Assistant Secretary of the Interior, on the subject of "Our Federal Mining Program."

The morning session on the first day consisted of a Metal Mining Defense Clinic, with State Senator J. Price Briscoe as moderator. Various problems relating to war production were discussed by authorities in each of these fields. At the afternoon session Ray H. Brannaman, Chairman of the Industrial Commission, spoke on the subject "Workmen's Compensation as Applied to Metal Mining," followed by Bernard E. Teets, Executive Director, Employment Security of the State of Colorado, on the "Effect of Social Security Act on Mining." This was followed by R. P. Fischer of the U. S. Geological Survey speaking on "Vanadium Deposits of Western Colorado" and Ogden L. Tweto with the subject "Boulder County Tungsten District." Merrill E. Shoup of Colorado Springs presented the subject "The Mining of Gold and Its Ramifications" followed by Julian D. Conover, Secretary of the American Mining Congress, who spoke on "Mining's Problems in Washington." The final talk of the day was that by F. E. Gimlet of Salida who gave "A Prospector's View of Mining."

On the second morning Dr. Ernest E. Wahlstrom presented the subject of "Strategic and Critical Minerals in Colorado," followed by Charles F. Jackson, Chief Engineer of the U. S. Bureau of Mines, on "The Production of Metals During the War Effort."

At the Sowbelly Dinner the principal speaker was Dr. Wilbur A. Nelson, Administrator of Mine Priorities in Washington, who explained the

Harry C. Chellson

Appointed Editor

Mining Congress Journal takes pleasure in announcing the appointment of Harry C. Chellson as Editor, effective immediately.

A graduate of the New Mexico School of Mines in 1923, Mr. Chellson had obtained early practical mining experience as a laborer and miner in coal and metal mines of Colorado and New Mexico. Following employment by the Miami Copper Company as diamond drill sample foreman, he spent five years in Mexico, where he was engaged in mining engineering, mine operation, mine examination and prospecting for such companies as Tigre Mining Company, Cia. Minera de Penoles, S.A. and the San Francisco Mines of Mexico, Ltd.

Returning to the United States in 1928, he undertook a geological survey of a group of silver-lead mines in the Pioche district of Nevada. From 1930 until 1932 he was employed, with other American engineers, by the Mining Trust of the U.S.S.R. in examinations and plans for development of copper, lead, zinc and coal mines in Central Asia, and in the development and exploitation of gold mines near the Manchurian border.

Following work on gold placer deposits in Colorado, he has been for the past seven years Associate Editor of Engineering and Mining Journal, New York. He has also recently completed the editing and revision of the fourth edition of the late Max W. vonBernwitz' "Handbook for Prospectors and Small Miners."

Mr. Chellson's broad knowledge of the mining industry and his experience in industrial journalism have brought him a wide acquaintance among all branches of the industry and make him excellently fitted to serve as editor of Mining Congress Journal.



manner in which the priorities on mining machinery and equipment are being applied.

Coal Mine Sold

The Nelms Mine, developed 13 years ago by the Ohio & Pennsylvania Coal Company under the direction of Joseph C. Nelms, has been purchased by the Youghiogheny & Ohio Coal Company. This large producer materially increases the capacity of the Youghiogheny & Ohio Company's properties. The mine is located east of Cadiz, Ohio, and is a fully mechanized shaft operation, and includes a modern preparation plant and washery. It was announced that the Ohio & Pennsylvania Coal Company would be dissolved following disposal of the mine.

Record Iron Ore Shipment

The shipping season for iron ore from the Lake Superior region was concluded on December 8, ending a season which has seen all previous records for shipment exceeded. A total of 80,111,745 gross tons of iron ore were shipped by boat from Lake Superior mines during 1941; of this total the mines of Minnesota accounted for 63,255,584 tons. The previous peak had been a total of 65,204,600 tons in 1929, so the previous record total was exceeded this year by 14,907,145 tons. Of the total, 79,664,785 tons was delivered from United States ports, while Canadian ports accounted for 456,960 tons. The first shipment of the season was loaded at Superior, Minnesota, on April 6, into a boat which had wintered there.

—IMPORTANT CHANGE IN MINING PRIORITY ORDERS—

● Provision made for higher ratings on mine equipment through amendments to orders P-56 and P-56-a

Immediately upon issuance by the WPB of amendments to mining priority orders, the American Mining Congress released to the industry the following announcement:

The War Production Board has again recognized the paramount importance of maintaining a flow of machinery and repair parts into the hands of mines, by amendments to orders P-56 and P-56-a. The amended orders are to become effective on Monday, March 2, and will continue to be administered by Dr. Wilbur A. Nelson, head of WPB's Mining Branch.

The new orders recognize the increasing difficulties which have been encountered, particularly by manufacturers of mining machinery, equipment, and repair parts, in securing many critical materials. Briefly, they provide the following:

As to Mine Operators

(1) The A-1-a rating is continued for cases of actual breakdown or suspension of operations. It requires specific approval in each case. A form showing information which the Mining Branch will require is enclosed. An important change is that ratings so granted will hereafter be extendable by the manufacturer to his suppliers as A-1-a ratings rather than as A-3.

(2) For mines producing war metals, coal, and essential non-metallic minerals, an A-1-c rating is provided for repair parts for machinery and equipment listed in Schedule A. This is a blanket rating applicable to all such repair parts, within a quota (in dollar value) which is to be set for each mine. Specific approval of the Mining Branch is now required in each case, but the purchase order must be endorsed as set forth in paragraph (e) (4).

For the first quarter of 1942 the quota is fixed by paragraph (c) (1) (ii), and may be determined by the operator from his own records. For subsequent quarters each mine must submit data called for by the Mining Branch as a basis for setting quotas. The form for this purpose is being prepared and upon receipt by the mine should be returned promptly.

(3) For mines of a "restricted" or less essential classification, including sand, gravel, crushed stone, clay, etc., the A-1-c rating may be used only for materials to avert breakdowns, and only upon specific approval in each case. The information needed in such cases is the same as for the A-1-a rating. This procedure also applies as to all mines for materials needed to avert breakdowns of equipment which is not on Schedule A.

(4) For new machinery and equipment, whether on Schedule A or not, the Mining Branch may recommend and the Director of Industry Opera-

tions may grant, whatever priority ratings are required to insure delivery. They are not limited to an A-3 rating as heretofore, but may issue any higher rating that is needed, depending upon the urgency of the situation. As before, each order for new machinery or equipment must be submitted to the Mining Branch for specific approval. *This is extremely important and the cooperation of mine operators, supply houses and manufacturers is essential.* A form showing information required by the Mining Branch in issuing priorities for new equipment is also enclosed.

(5) The A-3 rating, previously provided both for repairs and new equipment, is discontinued.

(6) An A-8 rating is provided for all repairs and maintenance not covered by the A-1-a or A-1-c ratings. It thus applies to repair parts for "essential" mines in excess of A-1-c quotas; to ordinary repairs and maintenance for mines of the restricted or less essential class; and to ordinary repairs and maintenance on equipment not on Schedule A. It also applies to consumable operating supplies. Specific approval is not required but purchase orders must be endorsed according to Par. (e) (4).

(7) An A-10 rating applies to repairs, maintenance and operating supplies not directly connected with production, such as office supplies. Again, specific approval is not required.

(8) *The A-1-a, A-1-c and all other ratings provided herein may be extended by the supply house or the manufacturer to his source of supply at the same level as submitted to him by the operator.* This is one of the most important changes in the new order.

(9) In case a mine entitled to an A-1-c quota on repair parts has placed orders for such parts prior to March 2 which are still unfilled, it may apply the A-1-c rating to such orders (provided it does not thereby exceed its quota), by forwarding to the sellers duplicate copies of the orders, endorsed as required under Par. (e) (4).

(10) The order operates to curtail priority assistance to mines in two respects which the War Production Board considers as not vital to the war program:

(a) It excludes mines in which the combined gold and silver account for more than 30 percent of the dollar value of the product. For such mines, the Mining Branch contemplates that priority assistance will be available only through use of the new form PD-1-a, for each order.

(b) It provides that preference ratings may be issued for machinery, equipment or repair parts only where they are to be used primarily to maintain or increase production and not primarily to reduce operating costs.

(11) The present serial numbers issued to mines will be reviewed, and will be continued in effect for mines in which 70 percent or more of the production (in dollar value) consists of "essential" minerals. Producers of sand, gravel, crushed stone, clay, etc., will be placed in a restricted classification, as noted above. Where 30 percent or more of the production consists of gold and/or silver, the mine is excluded from the order and its serial number will be withdrawn unless it obtains special relief.

After discussing this matter with the Mining Branch, we suggest that all mines producing appreciable quantities of gold or silver, who wish to retain their serial numbers, immediately file with Dr. Wilbur A. Nelson, Administrator, Mining Branch, War Production Board, Tempo E, Sixth and Adams Drive, S. W., Washington, D. C., a statement of their production for the calendar year 1941, showing both quantity and gross value of each metal produced. Also, in the event the value of the gold and silver combined exceeds 30 percent of the total, that the importance of the operation from the standpoint of production of needed war metals be thoroughly brought out.

From the outset the Mining Branch has endeavored to give all needed assistance to keep the mines operating. We believe it regrets the need imposed upon it today—by critical scarcity of materials—of curtailing such assistance; but that in spite of the 30 percent standard, it will endeavor to avoid any curtailment in production of war metals, and will endeavor to minimize hardship in all cases.

For those metals, coal, and non-metallics which the WPB considers essential to the War Program, the new order provides greatly improved priority status. Mining is again definitely recognized as No. 1 among major industrial classifications.

Order P-56 has no expiration date, but continues in force until revoked.

As to Machinery Makers and Suppliers

The revised order P-56-a amplifies the provisions for advance purchases by manufacturers, of materials required for mining machinery, equipment and repair parts, to fill rated orders under P-56.

The manufacturer's requirements, as reported on form PD-25-a, may hereafter be assigned whatever ratings are required to obtain delivery. It is contemplated that each company operating under P-56-a will re-file its requirements on Form PD-25-a, indicating opposite each material the rating needed to secure delivery from his source of supply by the date when needed. It will then be authorized to purchase specific quantities of mate-

rials, under specific ratings in each case. These ratings need not be limited to A-3 as heretofore, but may be as high as needed to secure essential materials.

It is suggested that manufacturers operating under P-56-a advise the Mining Branch at once when adjustments in ratings are needed on the materials for which an A-3 was previously authorized, giving full supporting data. Any changes in ratings which may then be made will not affect the aggregate quantities authorized; such quantities as are rated at higher levels will be deducted from the A-3 category, so as to leave the totals unchanged.

Materials purchased under authority of P-56-a are to be used in filling rated orders from operators under order P-56. The limitations in that order should therefore receive the manufacturer's careful attention.

Companies which have already executed their acceptance of order P-56-a will not be required to file a new acceptance form.

Reporting requirements are simplified under the new order. Quarterly reports from suppliers on form PD-81 or form PD-81-a are to be dispensed with. Manufacturers will not be required to file monthly reports under P-56; their reports will largely be concentrated on the single form PD-25-a (which may be amended during the year).

The order continues in effect until July 1, 1942, and is subject to extension or amendment.

Northwest Magnesite Expanding

Construction work for the new plant of the Northwest Magnesite Company is actively under way at Cape May Point, N. J. The company, jointly owned by the Harbison-Walker Refractories Company and General Refractories Company, has acquired the rights in the United States to the Chesny Process of producing synthetic magnesite for refractory purposes. The process has been applied in England on a large scale and has rendered that country independent of imported magnesite of natural origin formerly obtained from Austria and Manchuria.

To operate the Chesny Process of producing synthetic magnesite, the tract at Cape May Point has been acquired, together with extensive deposits of dolomite rock in Eastern Pennsylvania, located conveniently for shipment either by rail or by rail and water.

The capacity of the first unit will be approximately 40,000 net tons per annum. The lay-out, however, is such that additional units may be added as necessity might require.

The process was developed in England by Dr. H. H. Chesny, a resident of Los Angeles, Calif., working in co-operation with British producers of refractories. Several plants using the process have been built in England, and now supply not only the requirements of refractory magnesite for the British steel industry but also the magnesia necessary for the produc-

tion of magnesium metal. Magnesium metal has been produced in England from dolomite and sea water, starting with the Chesny Process, since 1939.

This process, protected by a large number of United States and foreign patents, consists essentially in replacing the lime content of calcined dolomite rock by magnesia through reaction with sea water. Its commercial success is the result mainly of specialized knowledge of the involved crystallography of magnesium hydrate. This compound in its usual form is a gelatinous substance exceedingly difficult to filter. Only by the application of a highly specialized technique can it be produced in a crystalline, readily filterable state and easily separable from the sea water and from the various salts dissolved in it. A further factor in the success of the process has been the design and development of the highly specialized equipment required to meet the conditions of its various steps.

The erection of the new plant is financed entirely by the Northwest Magnesite Company. The Office of Production Management has granted priorities to permit the completion of the plant within six months.

Silver in the Army's Big Guns

Nine and one-half pounds of silver go into the recoil mechanism of each 155 mm. gun and each 8-inch howitzer turned out by the Ordnance Department, according to reports of the War Department. Varying amounts of silver are used in the recoil mechanisms of all anti-aircraft guns and all field artillery pieces, from the 75 mm. howitzer to the enormous 240 mm. howitzer.

Since the World War, when the Army learned this use of silver from the French, the Ordnance Department has been following the practice. Many other substitutes for silver have been tried, some of which have been developed to the point where they could be used. But no substitute meets the requirements as well as silver. This is due to the metal's low coefficient of friction, its softness and its non-corrosive quality.

The silver is formed into cup rings and is used in conjunction with rubber and leather packings to retain oil and gas pressure in the cylinders of the recoil mechanism. The quality of the metal is much the same as coin silver, 90 percent silver and 10 percent copper. It is ideal for use in the cylinder interiors, which are polished to a mirror finish.

Illinois Institute Boat Trip

The 24th Annual Boat Trip and Summer Meeting of the Illinois Mining Institute will be held June 5-6-7, 1942, aboard the S. S. Golden Eagle, from St. Louis. The program will be announced at a later date.

Advised To Stock Coal

Domestic consumers who follow the advice of the Office of Solid Fuels Coordination and fill up their coal bins while mine and transportation facilities are still available need not worry about the deterioration of the coal in storage, Dr. R. R. Sayers, Director of the Bureau of Mines, has reported to Secretary Ickes.

The heating value of most coal suffers little from storage, Dr. Sayers stated. Experiments have shown that higher rank coals lose only about 1.2 percent the first year and 2.1 percent in two years. Lower rank coals may lose as much as 2 to 3 percent in the first year and about 5 percent in three years.

Neither should the domestic consumer be troubled much with spontaneous heating—a process resulting when oxygen in the air unites with coal—if he stores anthracite or a good grade of screened nut and lump bituminous coal. Anthracite is not subject to spontaneous heating. The large-sized high grade bituminous coal used in the majority of homes permits free circulation of air through the pile, thus carrying off any heat that might be generated spontaneously.

Agreement Concluded Between Chile and United States

The Chilean Ministry of Public Relations recently announced the conclusion of an agreement with the Metals Reserve Corporation of the U. S. for the purchase of all Chilean metal production not sold to others in the western world.

Metals covered in the agreement include copper, gold ore, concentrates, manganese, lead, zinc, antimony, wolframite, molybdenum, cobalt ores and refined mercury.

Practically all Chilean bar copper production, at present about 40,000 tons monthly, is going to the United States, but is not included in the agreement.

The Metals Reserve agreed to take a minimum of 165,000 tons of copper ore concentrates.

L. E. YOUNG

Consulting Engineer

Mine Mechanization
Mine Management

Oliver Building Pittsburgh, Pa.

PETER F. LOFTUS

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ENGINEERING AND ECONOMIC SURVEYS, ANALYSES AND REPORTS ON POWER APPLICATIONS AND POWER COST PROBLEMS OF THE COAL MINING INDUSTRY

Oliver Building Pittsburgh, Pa.

New Magnesium Source

Large quantities of olivine, an ore of magnesium, have been located in western North Carolina, and according to a survey by TVA geologists "because of its tremendous, low-cost reserves, and high magnesium content, (this belt) offers great potentialities as an ore of the metal."

A bulletin describing the "practically inexhaustible" reserve of magnesium ore has just been published by the North Carolina Department of Conservation and Development in cooperation with the Tennessee Valley Authority.

Experiments have been conducted for some time by the Olivine Products Corporation at Webster, N. C., for obtaining magnesium from the huge olivine deposits, and research is now being made by the TVA to develop an efficient process for utilizing olivine as an ore of magnesium.

Morenci Mine Producing

The large new open pit copper mine of the Phelps Dodge Corporation at Morenci, Ariz., went into production the last of January after five years development work. This mine will increase the annual primary productive capacity of copper in this country by approximately 7.6 percent and the capacity of the Phelps Dodge properties by about 44 percent. Within two months from the time of starting production the output is expected to reach the estimated scheduled capacity of 75,000 tons of refined copper per year.

It is understood that officials of Phelps Dodge Corporation and of the Defense Plant Corporation are already in the advanced stage of negotiations for means of increasing the facilities of the Morenci plant by an additional 80 percent; this will be about 60,000 tons of additional copper per year, and the total output at Morenci would be 135,000 tons of copper per year.

Mineral Production of Alaska in 1941

The minerals produced from Alaska mines in 1941 had an estimated value of \$26,193,000, according to a preliminary statement of the U. S. Geological Survey. This amount, which has been exceeded in only three years during the entire period since 1918, raises the total value of the minerals produced in the territory since 1880 to about \$860,000,000.

The value of the gold produced from Alaska mines in 1941 has been exceeded in only one other year—1940—since mining was begun in Alaska. Although gold continues to account for much the largest part of the value of the mineral production of the year, about 8 percent of the value of the total was contributed by coal, platinum metals, silver, lead, limonite, tin, antimony, tungsten, mercury, and copper, in the relative order in which their output during the year was valued.

The quantity and value of the coal produced in 1941 reached highs that surpassed all previous production records for coal in the territory.

Hanna Plant in Service

A new coal preparation plant was recently placed in service by the Hanna Coal Co. at Piney Fork in eastern Ohio, for preparing the coal received from the adjacent underground mine and from a strip mine further away.

The modern facilities embrace the washing, cleaning, drying of coal of 7-in. size and under, and the hand-picking of larger lumps.

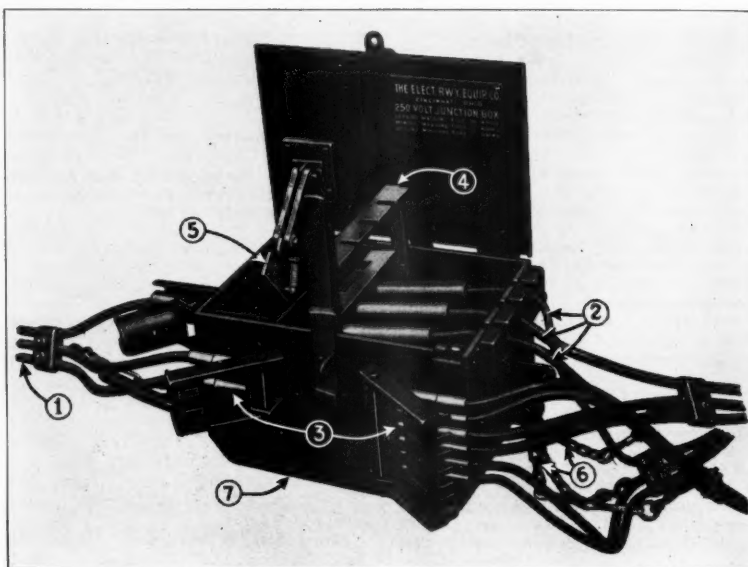
The machinery includes a trip feeder for mine cars; car transfer table; rotary dump; all the necessary screening, sizing, conveying equipment; two Link-Belt air-pulsated washers (for 7x1½-in. and 1½x0-in. coal); two

screen-type heat dryers for 1½x¾-in. coal; one centrifugal dryer for minus ½-in. coal; and for disposition of the rock and refuse—a rock crusher, conveyors, storage bin, and larry car.

The prepared coal passes from new plant to adjoining tipple, for loading, mixing, shipping to the market.

New Link-Belt Subsidiary

A wholly owned subsidiary of the Link-Belt Co., to be known as Link-Belt Ordnance Co., has been formed to operate a plant in Chicago, devoted solely to output of ordnance material. The plant was established in cooperation with the Government.



PAT. APPLIED FOR

The ELRECO No. 1228 JUNCTION BOX for D.C. circuits is the essential safety link between the power source and the coal mining equipment.

7 Features Guarantee Safe and Efficient Service

- No. 1. 3-Wire incoming power circuit cables (Pos., Neg. & Safety Ground). Safety chain and clamp relieves all strain on cable terminals.
- No. 2. Out-going positive cables for machine, loader and drill circuits, equipped with removable socket connectors having insulated handles.
- No. 3. Pin and socket type connectors for all negative and safety ground cables; mounted on the outside of box to secure complete separation from positive circuits.
- No. 4. Safety lever which must be lowered before main switch can be closed. This lever automatically locks all terminal connections in position and prevents any circuit being opened under load.
- No. 5. Quick Break Switch operated by the opening or closing of hinged junction box lid.
- No. 6. Detachable strain chains and clamps for each individual circuit and which prevents any strain on cable connector terminals.
- No. 7. Bottom skids to facilitate moving of box to different locations.

Standard equipment includes 200, 100 and 35 ampere 250-volt enclosed fuses—solder type terminal connections eliminate necessity of all vulcanizing or splicing of cables, and 28" height of box permits use in low coal seams.

The Electric Railway Equipment Co.

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Cincinnati, Ohio

THESE DU PONT PRODUCTS

Speed PRODUCTION AND *Lower Costs*

HERE are three du Pont products that can help you meet today's huge demand for ore — through increased efficiency, effectiveness and safety in underground operations. What's more, in many mines these products will contribute important savings.

FOR LOWER BLASTING COSTS, along with the other important properties needed for underground shooting, du Pont offers "Gelex,"* an outstanding semi-gelatin dynamite. "Gelex" cuts blasting costs at many mines because its good water resistance often permits it to be substituted for the more expensive gelatin grades. "Gelex" is plastic and cohesive — hence well adapted to loading, even in uppers. "Gelex" detonates with high velocity assuring excellent fragmentation, and it produces a minimum of noxious fumes, thus saving time at the face. With all of these advantages, it's not hard to understand why "Gelex" means greater speed, higher efficiency and lower costs in blasting.



GELEX semi gelatin dynamite



VENTUBE ventilating duct

BY KEEPING THE ATMOSPHERE CLEAN with "Ventube"*, you speed up work, and make it easier and safer. All you need is a suitable fan and tubing to reach workings. This flexible tubing is easy to hang — one man can install an entire system in a few hours. It takes little room, and goes around corners without appreciable loss of air.

"Ventube" is made of special impregnated cloth that resists acid water, damp and dry rot. Write for complete information.



CZC treated ties

TIES AND TIMBER LAST MANY TIMES LONGER when treated with Chromated Zinc Chloride. This longer life in mines is due to CZC's decay resistance. This treated timber is also fire retardant, clean, odorless and safe to handle.

You'll find CZC treatment a wise investment for cribbing, shaft timbers, air course timbers, haulage way ties — all timber above and under ground. Write for locations of the nearest treating plants.

*Trade Mark



E. I. DU PONT DE NEMOURS & COMPANY (INC.)

WILMINGTON, DELAWARE

State-wide Discussion of Economic Preservation

Following a preliminary meeting in Carson City on February 3, Governor E. P. Carville of Nevada, has called a state-wide economic conference of mining, agricultural, business and labor representatives to meet in Reno on April 9, 10 and 11. On the opening day each of the principal industries or groups will outline the problems confronting it today, followed by open discussion. Committees will then be appointed to meet on the second day and formulate plans for close cooperation and the pooling of all of the state's resources, to make the maximum contribution to state and national welfare. The third day will be devoted to a general assembly for the purpose of discussing and summing up the results of the various committee meetings and discussions.

Henry M. Rives, secretary of the Nevada Mine Operators Association, is serving as committee chairman for the mining industry in planning the conference.

Tin Smelter Enlarged

At an additional cost of \$3,000,000 to \$3,500,000 the tin smelter nearing completion in Texas will have its original capacity of 18,000 tons increased to 30,000 tons, according to Jesse

Jones, Federal Loan Administrator. The plant is being constructed by Tin Process Corp., a Government defense agency, and will be operated by the Dutch firm of N. V. Billiton Maatschappij.

The Metals Reserve Co., also a Government defense agency, has contracted for large quantities of Bolivian ore and for several months ships have been bringing it to Texas points where it is being stored pending completion of the smelter. Most of the ore is in the form of concentrates.

Gold in the United States, 1941

Total mine production of recoverable gold in the United States (territories included) was 5,858,871 fine ounces in 1941, a decrease of 2 percent from 5,984,163 ounces in 1940, according to preliminary figures of the Denver Office of the Bureau of Mines, United States Department of the Interior. The value of the gold, calculated at \$35 per fine ounce, was \$205,060,485 in 1941 and \$209,445,705 in 1940.

Of the total production in 1941 California contributed 24 percent, Philippine Islands, 19 percent; Alaska, 12 percent; South Dakota, 11 percent; Colorado, 6 percent; Nevada, 6 percent; Utah, 6 percent; Arizona, 5 percent; Montana, 4 percent; Idaho, 3 percent, and other states and territories 4 percent.

Coal Report Issued

The U. S. Bureau of Mines recently published Information Circular 7190, comprising the Annual Report of research and technologic work on coal for the fiscal year, 1941, by Arno C. Fieldner and L. D. Schmidt. The circular is a comprehensive report of the work performed by the Bureau during the year and includes sections on the properties and composition of American coals, coal mining, preparation of coal, storage and utilization of coal.

Manganese Process A Success

The Manganese Ore Company, a subsidiary of the M. A. Hanna Company of Cleveland, Ohio, recently announced the success of a process for concentrating low grade manganese ore. Several months ago 300 tons of low grade manganese ore was shipped from the Artillery Peak district of Arizona to San Francisco for experimental work.

The process is reported to be chemical rather than mechanical. The ore is crushed and then leached with water and sulphur dioxide fumes, which turns the manganese into a manganese sulphate. This is soluble in water and the solution is removed from the sludge and evaporated into crystals of manganese sulphate; a roaster then changes the manganese sulphate into oxide containing 60 to 65 percent manganese.

SIMPLICITY GYRATING SCREENS

Simplicity Gyrating Screens are the answer to that troublesome screening problem, which you may have in your plants. This strong statement is upon results secured since 1922.

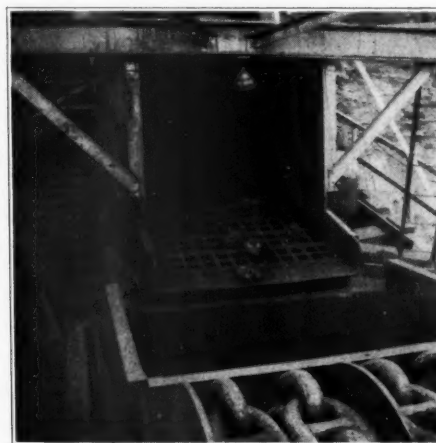
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Simplicity Screens are operating 24 hours daily, handling 900 tons feed per hour, scalping boulders up to four feet in diameter; they also make a complete range of separations down to screening ballmill sludge and dewatering fine coal.

Over 1300 plants are operating Simplicity Gyrating Screens today and these operators are our best advertising. We offer you screening results, not just claims. Simplicity screens are available in standard sizes, ranging from a 2' x 3' up to a 5' x 14' in one, two, three and four deck units. Standard inclined type or low head type screens are furnished without change in price.

Have our representative check your job, or write for our descriptive bulletin.

• • •



One of the 5' x 12' Scalpers handling 900 tph Iron Ore.

Simplicity Engineering Company

DURAND, MICHIGAN

Koppers Recreation Camps—1941

With a full realization of the fact that many of the young people now living in its various mining communities will, in time to come, have a definite part in the operation of its mines, the management of The Koppers Coal Company (now Koppers Coal Division, Eastern Gas and Fuel Associates) has for a number of years facilitated opportunities for wholesome development of the children of its employees.

It has encouraged and sponsored Boy Scout and Girl Scout troops, young peoples' clubs, and has established libraries at a number of its plants. Probably the most important and far-reaching activity has been the Summer Camps for both white and colored children. This project, established in 1935, has steadily grown in employee interest as well as in size. The construction of a modern, fully-equipped camp on property owned by the Koppers Recreation Camps, Inc.—a West Virginia non-profit corporation—has placed these camps on a permanent basis, assuring them a definite and enduring future. This camp, known as Camp Thomas E. Lightfoot, occupies 73.6 acres along the Greenbrier River, near Hinton in Summers County, W. Va., is complete in every respect, and is designed to provide the utmost in health, safety, and carefully supervised recreation for Koppers' children.

During 1941, 21 of the company's plants were represented at the camps by a total of 799 children—653 white and 146 colored. Ages of campers varied from 7 to 16, and a tabulation of the children by occupation of parents shows; superintendents 9, offices 58, stores 11, mine workers 695, outsiders 26.

Officers of the Koppers Recreation Camps, Inc., are as follows: P. C. Thomas, president; L. C. Campbell and Thomas E. Lightfoot, vice presidents; and James W. Tipon, II, secretary and treasurer.

West Davis-Geneva Iron Mine Developed

The Oliver Iron Mining Co., is developing the 32nd level of its West Davis-Geneva mine at Ironwood, Mich., on the Gogebic range. The development, consisting mainly of a long drift through rock, mostly granite, was begun about March 1, 1940, when a station was cut in preparation for the drifting. The drift reached the orebody last summer, constituting one of the major developments in iron mining in the Lake Superior district in recent years. The 32nd level is 200 feet below the previous lowest operating level, the 30th.

This work is being done from the Geneva shaft at a depth of 3,055 feet and at an elevation of 1,373 feet below sea level. It is the first opening below the 30th level, which was cut at a depth of 2,851 feet. There will be no intermediate level.

The Geneva shaft was sunk in granite, south of the iron formation, and at the 32nd level is approximately 1,800 feet south of the footwall. Consequently, much of the development work completed to date has been done in granite.

The main station, cut on the south side of the shaft, is 19 ft. wide and 36 ft. long, and is constructed of steel and concrete.

American Equipment in South Africa

The South African Mining and Engineering Journal recently stated that one of the manifestations of the drive towards increased mechanization by the Rand gold mining industry during recent years—a drive aimed at meeting the periodic recurrence of a native labour shortage, cutting working costs, and increasing efficiency still further—is the underground haulage locomotive. In this connection it is interesting to note that there are in operation on the Witwatersrand at the present time more than 200 models of one company alone, namely, The Goodman Company of Chicago.

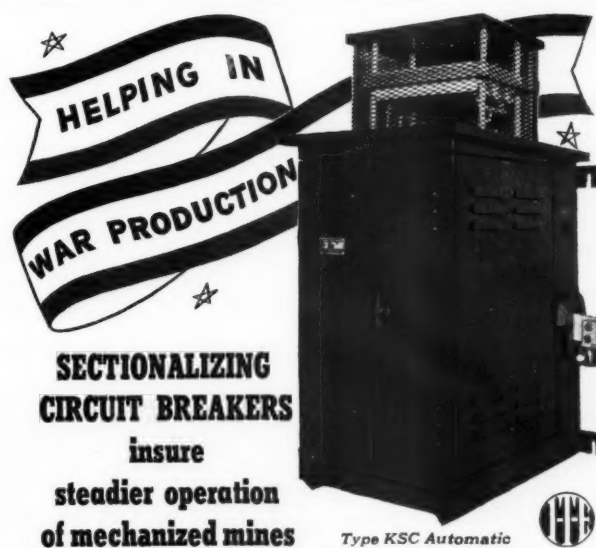
It is not generally known, perhaps, that since as long ago as June, 1937, Hubert Davies & Co., Ltd., of Johannesburg, have been manufacturing these underground haulage locos under license from, and to the design of, The Goodman Company. The decision to manufacture and assemble

these locomotives locally was originally taken in order to meet the necessity for quick delivery, and, in the intervening period, about 80 models have been turned out from the Hubert Davies' workshops. It should be mentioned that although the American company turns out many models, ranging in size from the 1½ ton storage battery locomotive to the 15 ton trolley loco, it was decided to make locally only the three sizes of storage battery machines most in demand. These are the Type 86—a 1½-ton model; Type ½M75A—a 4-ton single-motor model; and Type 149A040—a 4-ton two-motor model.

The motors, controllers and gears are imported from The Goodman Company, but it is noteworthy that, in the assembly of the machines, South African steel (ex Iscor) is used throughout. Rolled steel is used for the side plates, and the locos are fitted with cast steel bumpers, wheels, and axle boxes, and high-grade axle steel is used.

Coal Prices Not To Advance

Following reports of increases in retail coal prices in several localities, Leon Henderson, Administrator of the Office of Price Administration, in January requested retail coal merchants of the country not to increase prices above those which they individually charged for different grades and sizes in the period between December 15 and December 31, 1941.



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PHILADELPHIA, PA.

Representatives in Principal Mining Areas

Mineral Resources Report

The O'Mahoney Public Lands subcommittee has submitted a preliminary report to the Senate reviewing its activities to date and urging a vigorous research program to classify our known reserves in the West and determine which of them are the most available to meet our present requirements. While hearings have not been concluded and no legislative program is outlined the committee felt that a summary statement should be presented.

The report points out that we have neglected our own resources and have been content to depend upon the output of other lands. The importation of tungsten from China while failing to develop resources in the Inter-mountain States is cited as an example. The huge reserves of all types of coal also are mentioned as showing the vast capacity of the country.

Bauxite and other raw materials for the production of aluminum were discussed in detail during the hearings. It is pointed out that in view of the large demands of the defense program on aluminum production, the scarcity of bauxite may become serious in two or three years. The committee concluded that the production of alumina in the West from native raw materials such as alunite and high-grade clays is a long time development which seems inevitable.

The large source of manganese centering around the Missouri River in South Dakota is cited in connection with the work of the Bureau of Mines in developing this region. It is hoped that the exploratory work being done by the Bureau may result in processes which can supply a large part of the domestic requirements of this important metal.

Aside from a research program to classify our known resources, the report stresses the importance of providing facilities for production and fabrication near the location of the mines.

Production of Silver—1941

In the United States (territories included) the total mine production of recoverable silver was 67,052,469 fine ounces in 1941, a decrease of 7 percent from 71,824,746 ounces in 1940, according to preliminary figures of the Denver Office of the Bureau of Mines, United States Department of the Interior. The value of the silver, calculated for each year at \$0.711+ per fine ounce, was \$47,681,756 in 1941 and \$51,075,375 in 1940.

Of the total silver produced in 1941, Idaho contributed 25 percent and was foremost among the states and territories. Montana and Utah ranked second and third, respectively, each contributing 17 percent; they were followed by Arizona (11 percent), Colorado (11 percent), Nevada (9 percent), California (3 percent), New Mexico (2 percent), Philippine Islands (2 percent), Texas (1 percent), and other states and territories (2 percent).

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fine coal 1¼" x 0"
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Britain's Coal Industry May Be Nationalized

It was recently reported from London that the Executive Committee of the British Mine Workers' Federation had decided to support a plan for nationalization of Great Britain's coal industry. Proposals for legislation placing the mines under Government control had been under consideration by a joint committee representing the Federation, the Trades Union Council and the Labor Party.

Linde Air Products Builds New Plant

A 100-acre site near Kittanning, Pa., formerly occupied by the Armstrong County Fair Grounds, has been acquired by the Linde Air Products Company, a subsidiary of the Union Carbide & Carbon Corporation, for the construction of a new plant to cost \$3,000,000 or more for the production of oxygen. The plant is expected to be in operation next spring.

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Washington Mining Institute, 1942

For the fifteenth consecutive year the Annual Mining Institute sponsored by the College of Mines, University of Washington, Seattle, will be held during the period January 19 to 24, 1942. Staff members of the College will give lectures and laboratory demonstrations covering mining, metallurgy, and ceramics; operators and engineers will describe and illustrate field and plant activities. A joint session will be held with the North Pacific Section, American Institute of Mining and Metallurgical Engineers.

Meetings are scheduled for each day, including a field trip on Saturday to some plant in the Seattle area. The planned schedule permits attendance at a single meeting or a series of continuous meetings during the week.

Nickel Production At New High

In a statement issued by the International Nickel Company of Canada, Limited, Robert C. Stanley, President, recently stated that world nickel production and consumption in 1941 were at an all-time high. The sharp increase in demand arising from the joint British, Canadian and United States war effort required nickel production far beyond anything experienced in the past.

He said that the United States consumed over two-thirds of the world's total nickel output in 1941, as contrasted with an average annual consumption of about one-third during recent years. It is estimated that steel mills in the United States are currently consuming approximately 70 percent of the refined nickel imported into that country. Of the remaining 30 percent, foundries are taking 7.3 percent, brass mills 6.5 percent, heat resisting and electrical resistance alloys 4.6 percent, electroplaters 2.5 percent, and the balance is required for rolled nickel and high nickel alloys and a variety of other products.

All mines and smelters of the company operated at capacity throughout the year and the production rate has been raised in an endeavor to

satisfy the unprecedented war-time demands for nickel, he stated. To increase its nickel production by 50,000,000 pounds annually over its 1940 rate and thus make available a substantial additional supply, the company has undertaken a production expansion program to be completed in 1943 involving an expenditure of approximately \$35,000,000.

New River Company Expands Tipple Facilities

Roberts & Schaefer Co., Chicago, Ill., have been awarded contract by the New River Company, Mt. Hope, W. Va., for the installation of Hydro-Separator coal-washing equipment in their existing tipple. Capacity 150 tons per hour of 2½ x 0-in. coal; plant to be completed April 15.

Bureau of Mines Safety Instructors Sought Through Civil Service

The Federal Civil Service Commission has announced that it is recruiting safety instructors for positions in the Bureau of Mines, Department of the Interior. The salary is \$1,800 a year. Appointments will be made in the fields of coal and metal mining, quarrying, tunneling, and petroleum. All applications for the written general test must be on file with the U. S. Civil Service Commission, Washington, D. C., not later than March 30, 1942.

Two years' experience is required in a responsible position such as mine or section foreman, shift or fire boss, or safety inspector or engineer in the mining or petroleum industries. Before persons can be appointed from the employment lists established as a result of the examination, they must possess either a Bureau of Mines first-aid or mine-rescue certificate. Applicants must be between 25 and 35 years of age, and must meet certain rigid physical standards.

The duties of these positions include instructing classes in first-aid, accident prevention, and in the use of gas masks. Addressing safety meetings

and assisting with first-aid contests may also be part of the work. Instructors are subject to call at any time to help with rescues and recovery work following disasters. They will also assist in investigating the causes.

Copies of the announcement and application forms may be obtained at first- and second-class post offices or from the Civil Service Commission in Washington, D. C.

Air Freightage

(Continued from page 27)

as operations continue. The mine airport, constructed wholly by hand labor, cost one peso per cubic meter of material moved.

It is interesting to note that actual cost of this service was 6 percent higher than the original estimates. Of general interest is the size of the largest equipment handled: 150 H. P. diesels, 700-cu. ft. compressor, and a double drum hoist with a 6,000-lb. rope pull. Maximum weight of any individual piece was 3,800 lbs.

Everyone connected with aviation in the Philippines was most helpful. Parker van Zandt, of Pan American Airways, and Major Harvey Prosser, acting chief of the Philippine Bureau of Aeronautics, were of particular aid in passing judgment on the feasibility of the operation. Choice of plane was made by our pilot, L. G. Heston, and Edward P. Warner, aeronautical engineer. Special credit is due Chief Mechanic O. E. Swanson for the perfect record of all ships under his maintenance.

The equipment flown in made it possible to develop sufficient tonnage to justify an aerial tram to the coast. Without the assistance of aerial freightage, it is doubtful whether this prospect would ever have been brought into production.

COMPOUND "M"

STOPS COAL MINE DUST

1. At the face
2. On the haulageway
3. At rotary dumps
4. In the tipple

Wets the dust—not the coal. Increases health—safety—production. Ask the many satisfied users.

Compound M in water reduces the dust and increases the speed of wet drilling.

DUST CONTROL

From the face to the furnace

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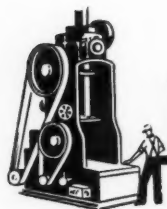
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★ The ideal permanent treatment for coal.

★ Easy to apply. Time tested. Harmless to metals and rubber belting.

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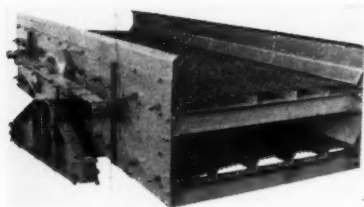
★ Economical, effective and long lasting.



MANUFACTURERS' Forum

New Robins-Cyrex Vibrating Screen Bulletin No. 115

Robins Conveying Belt Company, Passaic, N. J., has just issued a new Bulletin No. 115 which illustrates and describes in unusual detail their well known Robins-Cyrex Screen. This

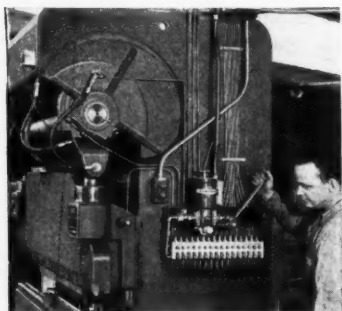


bulletin contains a unique X-ray section which permits the reader actually to build up a complete screen. There is also a large three-page spread in color containing many interesting installation views of these screens in varied applications.

Robins Bulletin No. 115 also contains valuable technical data on the selection and use of vibrating screens as well as complete dimension tables for the various standard sizes and styles available. Copies are available on request from the manufacturer.

Lubricating Systems For Industrial Machinery

Lincoln Engineering Company of St. Louis, Mo., pioneer manufacturers of engineered lubricating equipment for all purposes, have incorporated many new features in their latest centralized lubricating system. The Lincoln Centro-Matic system,



now in wide use on industrial machinery of all kinds, is an easily installed system for lubricating all bearings. The system consists of a number of injectors—one for each bearing to be lubricated, each connected to the

bearing by tubing or flexible high-pressure hose as required, and each individually adjusted to discharge the required amount of lubricant. The injectors can be mounted singly or in manifold and are supplied with lubricant from a central pumping unit.

An outstanding feature of the Lincoln Centro-Matic system is the single lubricant supply line between the pumping unit and the Centro-Matic injectors. Another feature is the wide range of pumping units now available, and the varied types of control. The pumping unit on the installation illustrated, is the new 2-lb. Lincoln Centro-Matic pump. It can be easily mounted on the machine, and a few strokes of the handle de-

Wartime Cooperation

Here's an example of American productive ingenuity and the way business is cooperating in our national drive for war production:

Following the Pearl Harbor attack and the declaration of war upon the Axis, the Aluminum Company was faced with the immediate diversion of the major part of its aluminum production to the manufacture of planes. This resulted, among other things, in some idle cabling machinery designed to manufacture electrical wire and cable.

At the same time, Anaconda Wire & Cable Company found its facilities pushed to the utmost to supply the increased war demand for electrical wires and cables of copper—especially cabling machinery.

Seeing an opportunity to relieve this bottle-neck, Harold V. Engh, executive vice president of the Anaconda concern, called R. R. Stevenson, general superintendent of the Aluminum Company—competitive interests were shelved for the duration—and in the shortest possible time, this cabling machinery was turned over to Anaconda Wire & Cable Company for a figure substantially under its original cost.

For Testing Rail Bonding

A new two-in-one instrument for testing efficiency of rail bonding in coal mine track systems has just been introduced by the Mosebach Electric & Supply Co., Pittsburgh, Pa. In addition to determining power losses through rail bonds, the instrument also enables operators to ascertain voltage decrease at any point in the line. Operation is simple and is accomplished by one man.

It is, of course, important to keep



voltage high at the face, for the following reasons:

1. Machinery operates at maximum efficiency at proper voltage.

2. Lower voltage means high amperage, increasing power costs and decreasing efficiency.

3. Low voltage "roasts" or burns out armature windings on equipment.

The Mosebach Rail Bond Tester and Voltmeter, by permitting operators constantly to check efficiency by bonding and power lines, minimizes difficulties resulting from inefficient jointing.

Size of the instrument is approximately 8 x 6 x 4½ inches and weight is only 3½ lbs.

Electric Switching Locomotive

Completion of a new 50-ton diesel electric locomotive for general switching use has just been announced by the H. K. Porter Co., Inc., Pittsburgh, Pa. Powered with two Cummins diesel engines, each developing 150 h. p., the locomotive has a tractive force of 30,000 lbs. at 30 percent adhesion. Overall size is 12 ft. high by 9 ft. 8 in. wide by 29 ft. 8 in. long over bumpers.

The new locomotive differs from the standard line of Porter diesel electric locomotives in the method of driving the second axle of each truck. Instead of the standard forged steel side rods, each truck is driven by a heavy duty chain enclosed in oil. Thus in this design, intended for use where extreme clearances and sharp curves are encountered, the overhang of side rods is eliminated.

For extreme strength, main frames are constructed of heavy steel plates, welded together with slab steel bumpers, and strongly braced lengthwise

and crosswise. Radiators, engines and generators are mounted on heavy steel bedplate designed so that the entire unit, with bedplate, can be removed easily.

Fire-Proof Transformers

Air-cooled, fire-proof transformers with Class B insulation first appeared about five years ago, in sizes from 150 to 500 kva. The development was immediately popular because of the great need for transformers that are fire- and explosion-proof and that require no special vault construction to meet fire-insurance regulations. This type of transformer is entering new fields. Two are particularly interesting. One is underground, as in coal mines. In one West Virginia installation a Westinghouse 165-kva, 2,300-volt, three-phase air-cooled transformer is replacing three single-phase oil-cooled units. A similar unit is being used 950 feet underground in a metal mine in Wyoming, as an integral part of a 300 kw ignitron-rectifier substation.

The air-cooled transformer is almost ideal for underground work because it eliminates hazards of fire and explosion of such concern in mines. In addition, the light weight and small dimensions of the unit make it particularly desirable for handling underground, where clearances are small and facilities for handling heavy objects are limited.

A particularly severe test of this air-cooled transformer idea was afforded in a potash plant. A unit was installed in such a plant in New Mexico in the fall of 1940. Although it is located in an atmosphere laden with rock-salt dust, the only servicing that has been required is a periodic blowing out.

With the defense program requiring new factories and extensions to old ones, extensive use has been made of the secondary-network system, ideally suited for supplying power that must not be interrupted, either by accident or by malicious intent. Just in time to be of great assistance in this program is the appearance of a completely air-cooled network unit, that includes the transformer, high-voltage switch and low-voltage protector. It can be installed any place indoors without requiring further enclosing structures.

Round Shank Boring Tools

A new series of standard Kennametal boring tools with round shanks, to be known as Styles 27-R and 29-R, has just been announced by McKenna Metals Company, Latrobe, Pa.

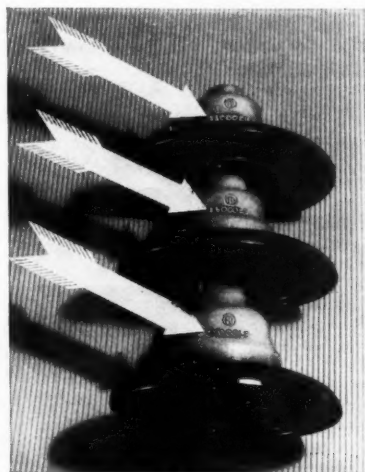
These new Kennametal tools have the same tool angles as other standard Kennametal boring tools, a feature of which is the 12 degrees positive back rake to compensate for the negative effect of the tool being held at height one-half the height of the shank above center. Style 27-R tool is for use in 30-degree boring bars,

and Style 29-R tool is for use in 45-degree boring bars. They are supplied in common shank sizes, the tolerance on the round shanks being plus .000 in. minus .001 in.

Styles 27-R and 29-R Kennametal tools are tipped either with Kennametal grade KM, the most widely used grade for machining steel, or with Kennametal grade K3H, the very hard grade used for precision boring and finishing cuts of all types. Because these two new styles have been classified as Standard Kennametal tools, shipments are made within 10 days of receipt of order.

Strength Ratings Now Marked on 10-Inch Suspension Insulators

To aid linemen, storekeepers and others who handle insulators in identifying various units, the Ohio Brass Company, Mansfield, Ohio, is now marking the M & E strength on the cap of every 10-inch suspension insulator it manufactures. These insulators have certain distinguishing features and vary widely in mechanical, electrical and thermal characteristics, but they are difficult to tell apart, the company states, because they all have a similarity in outside



appearance. In addition to saving time in identifying insulators, the manufacturer claims that the new marking system will minimize the possibility of getting improperly rated insulators on a line, will enable users to check performance against ratings after the insulators have served for a number of years, and will help in salvaging insulators for re-use should a transmission line be moved or altered. The markings are the cataloged M & E strength ratings and represent the minimum strengths of the 9,000, 11,000, 15,000, 25,000 and 36,000-lb. suspension insulators on which they are used. The figures are formed in the caps during the casting process and therefore are a permanent part of the insulators.

New Drum Carriers

A New Little Giant model has been added to the line of the Ernst Magic Carrier Sales Co., Buffalo, N. Y.

This model was designed and constructed for handling litherage drums



which are principally used as containers of heavy materials. One man using only one hand with this carrier takes the place of several men formerly required to break-over, balance and move drums. In addition, all accidents common to handling loaded containers are prevented by the simple lifting device and self-balancing tri-wheel design built into these carriers.

Variable Speed Control

A new V belt variable speed transmission known as the JFS-CUB is being introduced to industry by Standard Transmission Equipment Company of Los Angeles, Calif.

The JFS-CUB, the newest addition to the line of V belt speed controls manufactured by the company, is especially designed for all "A" section V belt applications and for speed ranges up to 3.3-1. Smooth sided pulleys are used rather than the inter-locking type. Among the advantages claimed are: the patented positive belt alignment feature which makes possible the mounting of the CUB in any and every position without impairing function or throwing belts out of alignment; machined and balanced cast iron construction, forced lubrication of the special bronze bearings on which the pulleys rotate; free-end pulley spindle to permit easy installation of belts; both pulleys on one side of pivotal mechanism which permits motor pulley and driven pulley to be almost directly in line with each other; etc.

The JFS-CUB is being introduced as a low cost speed control to make possible application on machines that never before could have the advantages of infinite speed selection because of expense. The CUB will transmit full capacity of "A" section V belts, and can be used with all machines now using that size.

**Made of Union-Formed Rope
to reduce chances of Accidents**

Tuffy

Mining Machine/Ropes

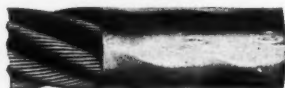
These superior wire ropes are scientifically designed to accommodate safely all mining machine requirements. Accidents are reduced, thus automatically reducing expenses and delays.

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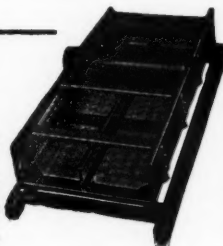
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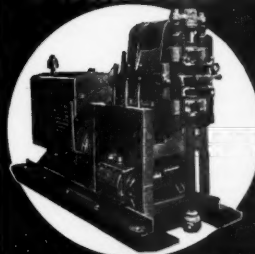
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HUNTINGTON, W. VA.

ROBINSON VENTILATING COMPANY

**Fans and Blowers
Ventilating Engineering Service**

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MINING CONGRESS JOURNAL

ARE YOUR SHEAVES

HARD ENOUGH...

OR...

LARGE ENOUGH?

For long rope life make certain your sheaves are of hard, wear-resisting metal. Soft sheaves wear rapidly. Once worn (and often corrugated) they both pinch the rope and develop a filing action. *Never put a new rope on a worn, scored or corrugated sheave.* Select the proper sheave material, depending on the rope pressures encountered. Any American Cable engineer will gladly give you the benefit of his long experience.

And sheave diameters are very important too.

If the sheave is too small, the sharp bend imposed upon the rope induces high bending fatigue and early rope destruction. To appreciate the importance of using correct diameters note that a 1" rope of 6 x 7 construction requires a 42" sheave while a 1" rope of 6 x 41 construction requires but an 18" sheave.

For average operations here is a table setting forth the proper minimum sheave diameters for ropes of varying constructions:

for 6 x 7 Construction	42 times diameter of rope
for 6 x 19 Seale Construction	34 times diameter of rope
for 6 x 16 Filler Wire Construction	30 times diameter of rope
for Flattened Strand (Type B & G)	30 times diameter of rope
for 8 x 19 Seale Construction	26 times diameter of rope
for 6 x 19 Filler Wire	26 times diameter of rope
for 6 x 22 Filler Wire	23 times diameter of rope
for 8 x 19 Warrington	21 times diameter of rope
for 8 x 19 Filler Wire	21 times diameter of rope
for 6 x 37 Seale	18 times diameter of rope
for 6 x 41	18 times diameter of rope

Paying attention to your sheaves pays dividends in longer rope wear, less trouble and steadier production. Specifying **TRU-LAY PREFORMED** pays dividends in the same way. Consult your nearest American Cable wire rope engineer. All American Cable ropes made of Improved Plow Steel are identified by the Emerald Strand.

AMERICAN CABLE DIVISION • WILKES-BARRE • PENNSYLVANIA

District Offices: Atlanta, Chicago, Detroit, Denver, Los Angeles, New York, Philadelphia, Pittsburgh, Houston, San Francisco

AMERICAN CHAIN & CABLE COMPANY, Inc.

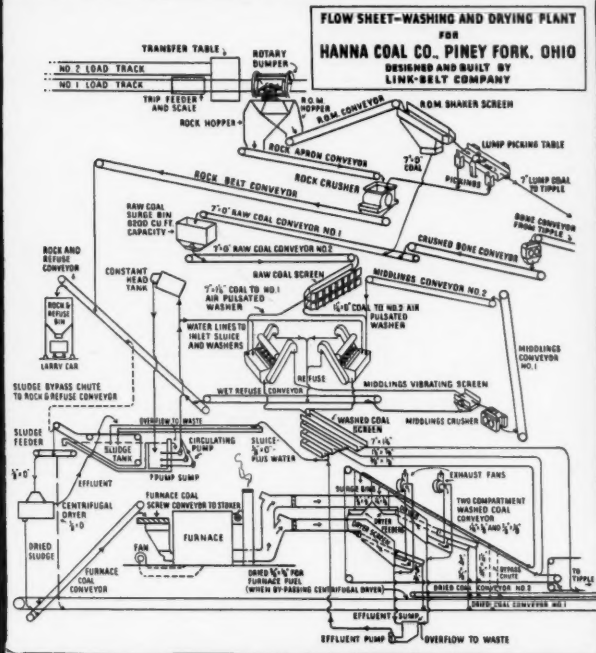
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ESSENTIAL PRODUCTS ... AMERICAN CABLE Wire Rope, TRU-STOP Emergency Brakes, TRU-LAY Control Cables, AMERICAN Chain, WEED Tire Chains, ACCO Malleable Iron Castings, CAMPBELL Cutting Machines, FORD Hoists and Trolleys, HAZARD Wire Rope, Yacht Rigging, Aircraft Control Cables, MANLEY Auto Service Equipment, OWEN Springs, PAGE Fence, Shaped Wire, Welding Wire, READING-PRATT & CADY Valves, READING Electric Steel Castings, WRIGHT Hoists, Cranes, Presses ... *In Business for Your Safety*

With Hanna at Piney Fork

Their Newest LINK-BELT PLANT Provides Quality Production of All Sizes



One of two screen-type heat dryers for $1\frac{1}{4}' \times \frac{3}{4}'$ and $\frac{3}{4}' \times \frac{1}{4}'$ washed coal.

Rotary dumper. Transfer table permits single dumper to discharge cars arriving from two tracks.

Raw coal conveyor to shaker screen which presizes feed to two washers

Picking table for plus 7" lump received from R.O.M. screen.

Hanna Coal Company—pioneer in the washing of Ohio coal—has again selected Link-Belt preparation equipment. This time it's Piney Fork—their third Link-Belt preparation plant now aiding in the war effort with full production. These modern facilities illustrated, embrace the dumping, conveying, washing, cleaning and drying of coal, 7" and under, and the hand-picking of larger lumps.

LINK-BELT COMPANY

Chicago, Philadelphia, Wilkes-Barre, Pittsburgh, Cleveland, Huntington, W. Va., Kansas City, Mo., Indianapolis, Detroit, St. Louis, Seattle, Toronto, Vancouver. 8752

Two air-pulsated washers clean $7' \times 1\frac{1}{4}'$ and $1\frac{1}{4}' \times \frac{3}{4}' \times 0'$ respectively.

Another general view taken in front of dump house.

LINK-BELT HANDLING PREPARATION EQUIPMENT

V
2
8
1
3

M
A
R

4
2
2
x